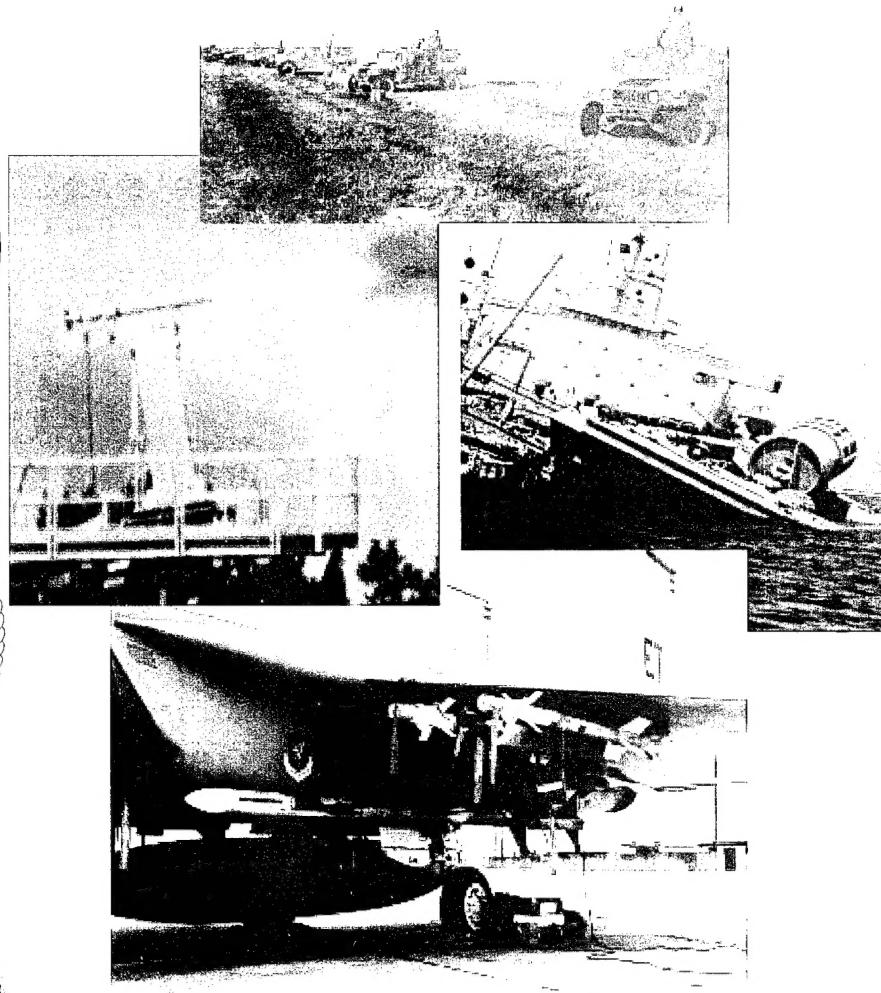
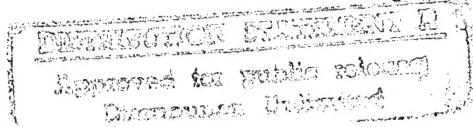


Joint Feasibility Study Handbook



Office Of The Under Secretary Of Defense
(Acquisition and Technology) Director,
Test Systems, Engineering and
Evaluation / Test and Evaluation



DTIC QUALITY INSPECTED 1

**JOINT FEASIBILITY STUDY
HANDBOOK**

1996

Approved by

Office of the Under Secretary of Defense (Acquisition and Technology) Director,
Test Systems, Engineering and Evaluation/Test and Evaluation

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FOREWORD

The Joint Test and Evaluation (JT&E) Program has been established to evaluate concepts and address needs and issues that occur in joint military environments. The program includes the nomination process; the Joint Feasibility Study (JFS), which determines whether selected nominations are needed and feasible; and, when such a determination is made, the execution of a JT&E by an Office of the Secretary of Defense (OSD) chartered Joint Test Force (JTF).

DoD Directive 5000.3-M-4 describes the JT&E Program process, identifies the principle participants and their responsibilities, and outlines the framework within which each Service supports the program. Service support is described in detail in applicable Service directives and the Memorandum of Agreement on Multi-Service Operational Test and Evaluation and Joint Test and Evaluation which is maintained by the Services' Operational Test Agencies (OTA).

This handbook is one of three that discuss testing and evaluation in the joint military environment: the *Joint Test and Evaluation Nomination Handbook*; the *Joint Feasibility Study Handbook* and the *Joint Test and Evaluation Handbook*. These companion volumes are designed to provide OSD guidance and direction, information, references, and procedures to joint test directors and their staffs. These handbooks provide "how to" lessons learned based primarily upon inputs from personnel who have participated in JFSs and JTFs in various capacities.

The proponent of this handbook is the Deputy Director, Test and Evaluation.

Recommended changes or suggestions for additions should be forwarded to:

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3110-Defense Pentagon, Room 3D1080
Washington, D.C. 20301-3110

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U95-4421

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CHAPTER 1

JOINT TEST AND EVALUATION PROGRAM BACKGROUND

A. INTRODUCTION

The Department of Defense (DoD) Joint Test and Evaluation (JT&E) program originated in response to the 1970 Blue Ribbon Defense Panel Report. The panel report concluded that *"There has been, and is currently, no effective means for conducting productive joint operations tests and evaluations. The fact that some such efforts heretofore have encountered difficulties and achieved few useful results does not obviate the requirements for much needed joint operational test and evaluation."* The report recommended that continuing responsibility for joint testing be vested in an Office of the Secretary of Defense (OSD) staff element dedicated to test and evaluation (T&E). While the original emphasis was on joint operational T&E, evolving multi-Service needs and issues have led to an expansion of the effort to include joint developmental as well as operational T&Es. The JT&E program is directed by the Director, Test, Systems Engineering and Evaluation (D,T,SE&E).

The Deputy Director, Test and Evaluation (DDT&E) manages and administers the JT&E program and develops the means to ensure that productive testing is accomplished. The policies and details in the JT&E program are set forth in *DoD 5000.3-M-4, Joint Test and Evaluation Procedures Manual*. The JT&E Procedures Manual provides a description of the JT&E program, OSD and Service responsibilities

relative to the program, and defines the JT&E nomination and selection process. Key to the management structure is the independent status of the OSD JT&E program. That is, the program is structured so that it minimizes the influence of Service biases. The Feasibility Study Director (FSD) and Joint Test Director (JTD) report directly to OSD for direction so that the JT&E findings are approved by OSD. Additionally, OSD is the primary source of JT&E funding, thus assuring independence of program control.

While Joint Feasibility Study (JFS) and Joint Test Force (JTF) activities are conducted in accordance with established joint procedures, consistency is maintained with the assigned mission of each participating Service. Responsibility for conducting a JFS is assigned to a lead Service. The JFS is supported by personnel and resources from the designated participating Services.

B. PURPOSE

The purpose of a JT&E is to:

- Assess the interoperability of Service systems in joint operations and explore potential solutions to identified problems.
- Evaluate and provide recommendations for improvements in joint technical and operational concepts.
- Develop and validate system development and testing methodologies having multi-Service application.

- Evaluate technical or operational performance of interrelated/interacting systems under realistic joint operational conditions.

The purpose of a JFS is to conduct an in-depth analysis of a JT&E nomination and provide information and recommendations upon which the Senior Advisory Council (SAC) and the D,T,SE&E will base decisions relative to the chartering of a JT&E. This information will include an accurate projection of the resource requirements (funding from OSD and the Services, test assets, troops, JT&E personnel, contractor support, exercise participants, administration, comptroller, accommodations, etc.) that must be provided by OSD and the Services. The JFS will focus on what concepts or issues the nominated JT&E will resolve, how the JT&E will resolve them, whether there is a broad support base for the JT&E, and whether the JT&E is needed and feasible. The lead and participating Service points of contact (POCs) will use the JFS results to pre-brief the SAC members on the resource requirements if a JT&E is being recommended.

C. JT&E PROGRAM

The JT&E program is composed of three separate but closely related activities.

- 1) The nomination, coordination, and approval of concepts or issues to be addressed by a JT&E.
- 2) A feasibility study to determine the need and feasibility of the approved nominations.

- 3) The execution of those JT&Es that show potential for significant improvements in joint capabilities.

Figure 1-1 is an overview of the sequential relationship of these activities. JT&E activities are sequentially accomplished with reviews conducted at designated milestones to assure that OSD and Service resources are available and are wisely expended. The activities are designed to be expanded in both scope and level of detail as information and expertise are developed, thus increasing confidence in program decisions at the designated milestones. For this reason, the Feasibility Study Director (FSD) and staff must fully understand the entire JT&E program in order to be able to refine the concepts, issues, objectives, plan of action, milestones, and estimate of resources that were developed during the nomination process. The JFS must also consider JTF requirements (location, personnel, and resource requirements) based on the assumption that a JTF will be chartered.

The JT&E program cycle begins each year with a request (call) from the D,T,SE&E to the Services, commanders in chief (CINCs), defense agencies, the joint staff, and the OSD staff for nominations. This call is usually made in October/November with the stipulation that proposed nominations be forwarded to the D,T,SE&E by early March. The CINCs, Services, and defense agencies develop and refine their nominations and forward them in the format prescribed in *DoD 5000.3-M-4*. **Figure 1-2** is an overview of those activities that are involved in the JT&E nomination process. **Figure 1-3** relates the nomination process and major JFS activities to suggested

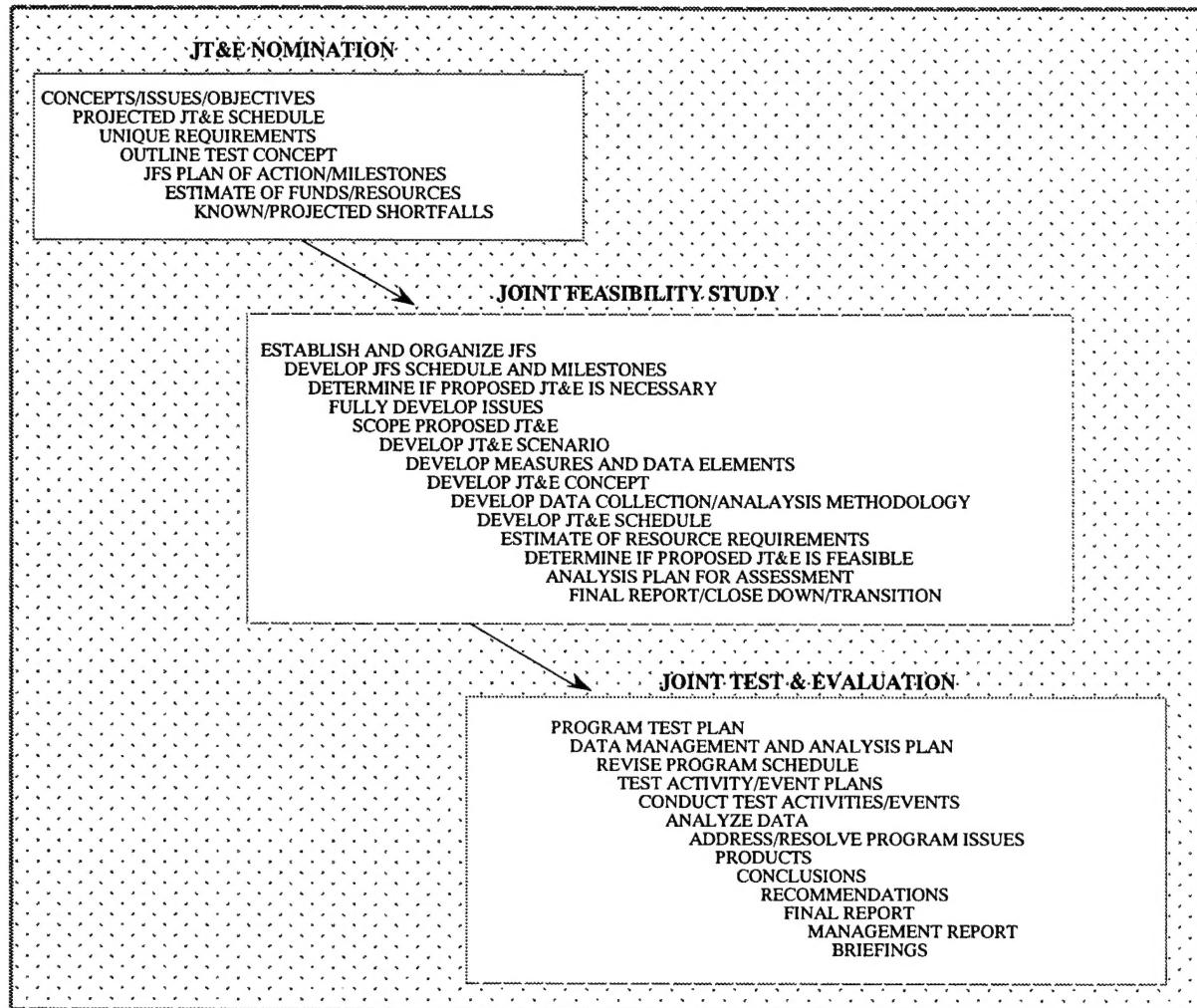


Figure 1-1. JT&E Components

milestones. Nominations must address needs, concepts, or issues that involve more than one Service and must contain an explicit purpose statement with expected results and issues to be addressed. Each nomination should also include:

- A POC and how to contact him or her.
- Anticipated users and a list of agencies/organizations/CINCs concurring in the nomination.
- A projected JT&E schedule.
- The identification of unique requirements.
- Suggested JT&E participants.
- An outline of the test concept.

- A JFS plan of action and milestones.
- An estimate of required funds.
- Known or projected shortfalls.
- The name of the recommended FSD.
- The products and expected benefits in terms of an increase in joint warfighting capability.

Upon receipt of all nominations, a JT&E Planning Committee (PC) will be convened to review and winnow the nominations and prepare the highest priority candidates for SAC review. The JT&E PC is mostly composed of Service representatives that will exchange information on

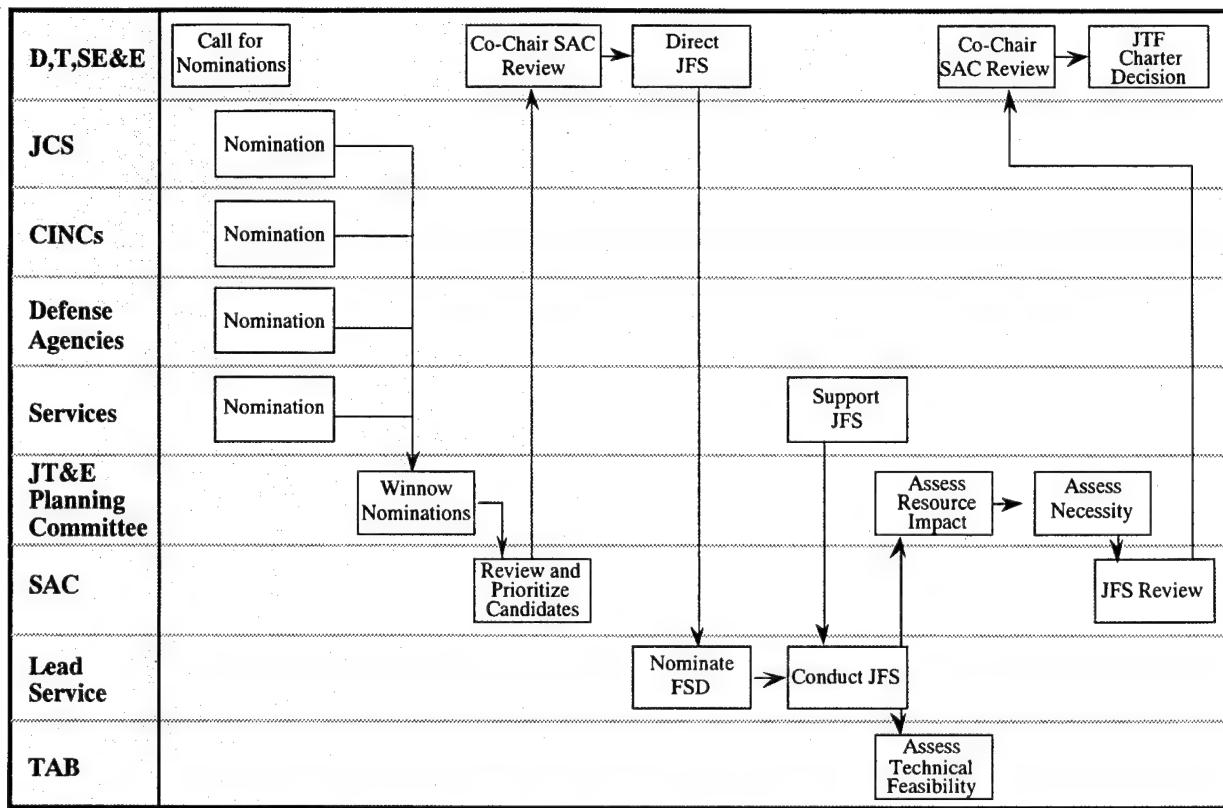


Figure 1-2. JT&E Nomination and JFS Activities

Service positions, coordinate on projected resource requirements, and assist in the preparation of a nomination report that is to be presented to the SAC. The makeup and responsibilities of the JT&E PC are outlined in *DoD 5000.3-M-4*. The JT&E PC joint staff member will provide joint exercise information during the nomination review process.

DoD 5000.3-M-4 also outlines the membership, duties, and responsibilities of the SAC. The SAC reviews the JT&E PC reports and develops recommendations relative to which candidates should be approved, prioritizes the candidates, and recommends which candidates should proceed to a JFS or directly to a JT&E conducted by a JTF. Based on the SAC recommendations, the D,T,SE&E approves candidates for execution, designates the lead and

participating Services, considers the lead Service recommendation for FSD, appoints the FSD, and directs the JFS to be conducted.

Under the oversight of OSD, the lead Service will conduct a JFS to expand and refine the candidate, assess the need and feasibility of executing a JT&E, and prepare a recommendation to the SAC and the D,T,SE&E relative to potential courses of action. The designated participating Services will provide resources as stipulated in the JFS directive.

The JT&E Technical Advisory Board (TAB) is an organization of senior civilian scientists and engineers from OSD and the Services that provides advice to the JT&E PC, SAC, OSD sponsors, and the FSD on technical issues related to the JT&E program. *DoD*

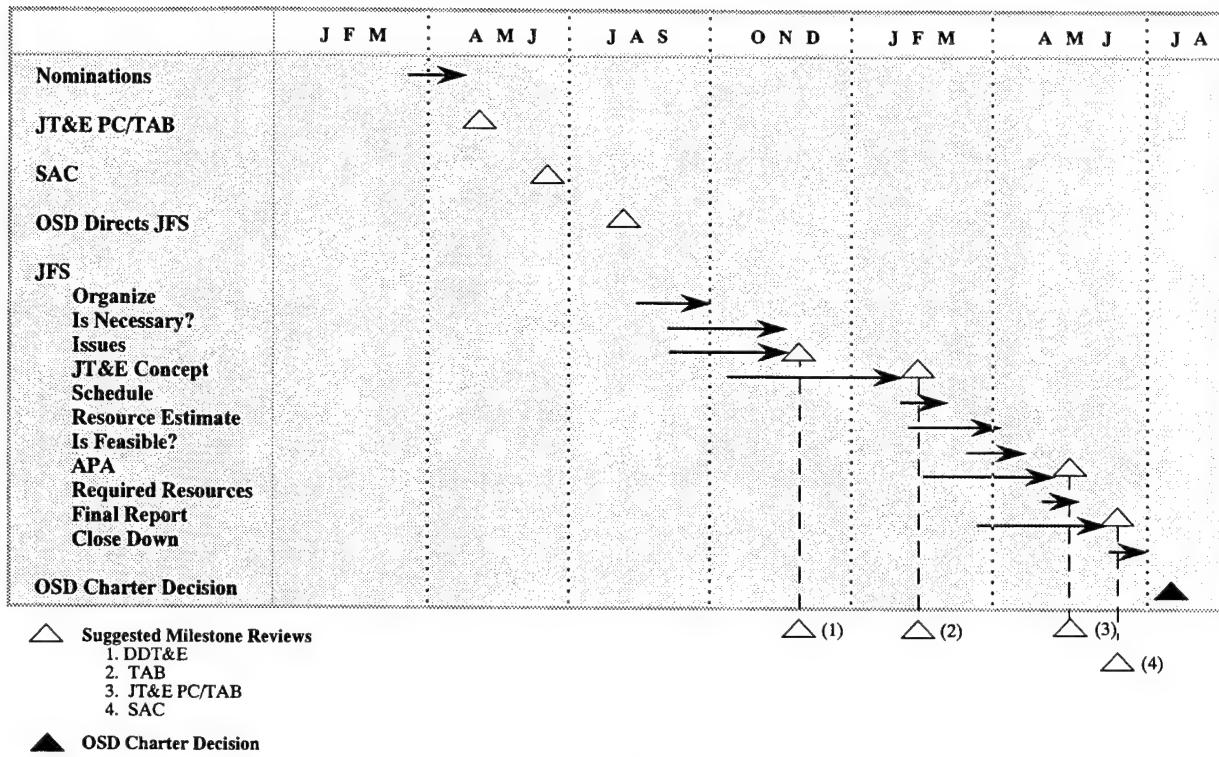


Figure 1-3. JFS Milestones

5000.3-M-4 outlines the membership, duties, and responsibilities of the TAB. The TAB chairman also serves as the technical advisor to and is a nonvoting member of the SAC. The FSD will formally present test concepts, test designs, and study results to the TAB for technical review, comments, and recommendations. It should be noted that JT&E PC members, in addition to representing their organization/Service during the nomination process, frequently are called on to act as the T&E Liaison for the members. When the DDT&E is satisfied that the JFS is accurate and complete, the FSD will present the JFS results to the SAC. The SAC will consider the JFS final report and recommend to the D, T, SE&E whether or not the proposed JT&E should be chartered for execution.

If the JFS involves issues that pertain to policy, doctrine, or tactics, the FSD should consider the option of establishing a General Officer Steering Committee (GOSC). The GOSC would consist of flag officers (1-2 star level) from the Services who would advise the FSD on Service policy, doctrine, tactics, and roles/missions related to the JT&E. The organization and roles of the GOSC members would be dictated by the particular objectives of the JT&E. If established, the FSD should include the GOSC in the review cycle of JFS concepts, products, and documents.

CHAPTER 2

ESTABLISH AND ORGANIZE THE JFS

A. INTRODUCTION

This chapter explains the relationship of the JFS to the JT&E and describes those actions that must be accomplished upon activation to obtain facilities, personnel, and administrative support. The chapter also addresses the functional and organizational requirements that should be considered in structuring the JFS.

B. INITIAL ASSISTANCE

One of the first tasks of the newly appointed FSD will be to contact the lead Service, participating Services, OSD, and as an option the Defense Evaluation Support Activity (DESA) JT&E POCs to discuss, in detail, requirements, available support, reporting, and expectations. Annex C is a list of Service headquarters, operational test agencies (OTA), OSD, and DESA JT&E POCs. JFS support is the responsibility of the lead Service. The FSD should establish liaison with the POCs at both the Service headquarters and OTA levels because both have an interest and involvement in the potential JT&E.

When a JFS is directed, the lead Service headquarters will issue an order, letter, or directive that designates a subordinate command or agency to function as their support agent for the conduct of the JFS. Likewise, the headquarters of the participating Services will designate a subordinate command or agency to function as their JFS support agent.

The nomination process itself involves a number of planning and coordination activities which relate directly to JFS requirements. All documents supporting these activities should be obtained from the lead Service headquarters POC.

As a minimum, the following documents should be obtained.

JT&E nomination documents contain a description of the proposed JT&E in terms of purpose and expected results, concepts, issues, objectives, problems, utility, and impact on joint effectiveness. These documents also identify anticipated users of the results and provide a proposed program schedule/milestones; the identification of unique hardware, software, environment, personnel, and instrumentation requirements; an outline of a test concept; a proposed JFS plan of action and milestones; an estimate of funds and resources required; known or projected shortfalls; and CINCs/agencies/organizations concurring in the nomination. While some nomination documentation is more complete than others, it should still serve as the starting point for every JFS because it provides the FSD with an understanding of the issues or proposed concepts as seen through the eyes of the nominating command or agency.

The JT&E PC reviews the nominations; if applicable, recommends combining with other nominations; identifies opportunities for incorporation into activities already scheduled in conjunction with joint or Service exercises;

determines multi-Service participation and the ability of the Services to provide the necessary manpower and facilities; considers the utility of the results; and estimates the impact of these results on joint capabilities. The JT&E PC minutes also provide initial inter-Service coordination and identifies the major participants and users of test results who must be included in the coordination of JFS-produced documents and products.

The SAC reviews the JT&E PC recommendations and recommends which nominations should become candidate JFSs. The SAC minutes also prioritize those candidates that are recommended for approval and suggests which require a JFS and which should proceed directly to a JT&E. A SAC recommendation for approval is Service and Joint Chief of Staff (JCS) concurrence in the selected candidate(s) concepts or issues and its (their) definitive objectives. It is also an initial commitment that Service support will be available. *It is very important that concepts, issues, objectives, personnel, equipment, and cost be solidified early in the JFS. The SAC report (Service and Joint Staff concurrence) is one of the key documents to be used to achieve this end.* Additionally, the SAC priority listing is indicative of JT&E importance to DoD in the event that budget reductions occur and alternative considerations are required.

JFS directive authorizes the execution of the JFS, designates the lead and participating Services, and approves the appointment of the FSD. This directive contains the concepts or issues and objectives and provides for JT&E program-unique funding for the JFS. Since it

represents OSD concurrence, it should be used in conjunction with the SAC report to solidify JT&E concepts or issues and objectives. This is not to say that they cannot be revised or rescoped as the JFS concept matures. Revisions and changes should be considered when necessary. If significant revisions or changes are needed, they should be made with the DDT&E concurrence.

Service directives and instructions relating to JFS support are written by the headquarters staffs of the lead and participating Services to subordinate commands or agencies outlining responsibilities and priorities for providing support for the JFS. These directives/instructions provide the FSD and Service deputies with the authority to coordinate directly with supporting organizations to obtain facilities, administrative support, and staff personnel. These directives also provide the designated support agents with the authority to provide the required support.

Archive documents produced by completed or ongoing joint tests are maintained in the AFOTEC OT&E Data Branch Library. This library contains numerous charters, directives, Program Test Designs (PTDs), Program Test Plans (PTPs), final reports, and management reports. While some of these documents may not directly relate to the JFS, many JT&E challenges are systemic to the process and have been previously faced and documented by other JFSs and JT&Es. Of specific interest should be the management reports, which contain the lessons learned from previous JFSs and JT&Es along with the director's recommended improvement/corrective actions. This material is available to all FSDs and their staffs. The FSD

should visit the AFOTEC library at Kirtland AFB to review and determine which of the available documents may be applicable. Request for documents should be addressed to:

AFOTEC/RS
Directorate of Research Service
8500 Gibson Blvd. SE
Kirtland AFB, NM 87117-5558
Telephone: (505) 846-2574/DSN 246-2574

C. IMMEDIATE REQUIREMENTS

When a JFS is activated, the FSD will be faced with a myriad of requirements that include establishing and organizing the JFS, conducting literature searches, obtaining documents and directives, establishing liaison with POCs, etc. Immediate requirements will center on:

- Obtaining an adequate JFS Headquarters site.
- Obtaining qualified staff and support personnel in a timely manner.
- Obtaining support resources (e.g., communications and computer equipment).
- Refining the JFS budget and securing the required funds.
- Organizing the JFS and developing a work breakdown structure (WBS) and schedule.
- Establishing support and coordination POCs among the Services, Joint Staff, and OSD.
- Providing for security of JFS actions, documents, and records.

A key to a good JFS is a *lean organization* staffed with *fully qualified* and *experienced* personnel from all the Services who maintain continuous communications with the Services. The FSD should have been

identified during JT&E PC coordination. In the case of a Service nomination, the nominating Service will be assigned as the lead Service and the nominating organization within that Service will most probably be directed to function as the JFS support agent (the nominating organization has interest and involvement). Ideally, the proposed FSD should have been involved in the JT&E nomination process and be immediately available to initiate JFS actions. The designated participating Services will be aware of support personnel requirements (Services agreed during JT&E PC coordination) and should provide the Service deputies and support personnel on a temporary duty (TDY) basis as soon as they are requested.

Initiation of the JFS activities should begin almost immediately after the D,T,SE&E issues the JFS directive. The lead Service support agents will use their own facilities, personnel, and resources to conduct the JFS. OSD will provide funds to pay for costs that are unique to the needs of the JFS. DESA is available to provide management (contract, safety, security, resource, environmental, logistical, and fiscal) and technical (engineering, analysis, and instrumentation) support. In order to obtain DESA support, the FSD should contact the DESA JT&E POC to develop a Program Initiation Document (PID) between the FSD and DESA.

In the case of CINC/OSD/Joint Staff nominations, the JT&E PC will recommend which of the Services should function as lead and which should provide support. From that point on, the procedures for assigning JFS responsibilities are the same as described above. If the organization responsible for conducting the

JFS is not the nominating organization or agency, some delay may occur as the lead Service identifies and acquires the required facilities and resources and assigns the FSD.

The FSD is directly responsible to the DDT&E for the organization, management, and execution of the JFS. The FSD is authorized by the D,T,SE&E to establish direct communications with Service or DoD agencies to obtain assistance or support required for the JFS. One of the major aspects of the JT&E program that is most frequently underestimated is that the FSD will be required in a relatively short time frame to establish a totally new and independent organization with all its attendant problems. As a minimum, initiating the JFS effort will involve establishing an organizational structure and obtaining adequate facilities, qualified staffing, and support resources.

Facilities

The JFS directive and Service order, letter, or directive that implements the JFS will stipulate where the JFS will be located and who is responsible for providing the required facilities, resources, and support. Facilities, resources, and support include such things as heat, light, furniture, safes, administrative equipment, computers, and access to network bulletin boards and on-line services (e.g., MILNET/TECNET). ***Provision of this support is the responsibility of the lead Service.*** Some installations have facilities established and designated to support short term projects such as JFSs. On other installations, the FSD and the designated support agent POC must negotiate with the host installation to obtain the required facilities. Assuming the JFS will consist of 10-

12 personnel, the FSD should negotiate to acquire 1500-2500 square feet of usable office floor space, preferably at a single location. While most of the space will be used for offices, one conference area of at least 500 square feet should be available for use also as a collective WORK area.

In most JFSs, some of the work will involve classified materials. Controlled access to the JFS facility and the storage of classified materials must be considered. If the JFS involves information and discussions that require a Special Compartmented Information Facility (SCIF), these special requirements must be addressed through the designated support agent POC.

Staff

Designation as the lead Service carries the responsibility of supporting the JFS with the director, one of the deputies, and the majority of Service personnel; and providing administrative services and assistance in the areas of secretarial support, travel, contracting, personnel, administration, comptroller, supply, and logistics (see *DoD 5000.3-M-4*). Participating Services will provide deputies as stipulated in the JFS directive. *DoD 5000.3-M-4* further states that the Services will provide fully qualified personnel (both military and civilian) to staff the JFS. One of the FSD's initial tasks will be to determine staff requirements in terms of numbers, rank, and qualifications and submit these requirements to the Service headquarters POCs for action by the Service personnel systems. If the FSD was involved in the JT&E PC, JFS staff requirements should have been established and coordinated with both the lead and participating Services

during the JT&E nomination process. Staffing these positions will then depend on the ability of Service personnel systems to respond to FSD requirements.

While staffing procedures are being established, it is sometimes difficult for the Services to provide qualified personnel in a timely manner. Available personnel, or personnel who happen to be on site, are sometimes assigned to these positions. Others have been assigned as an additional duty. The FSD should insist on the assignment of fully qualified full-time personnel, and all should be required to be located at the JFS location. This could be accomplished through the use of Service-sponsored, long-term training opportunities. Service POCs should be queried as to the availability of this option. While this might result in the obtaining of qualified personnel for the duration of the JFS, it should be noted that these opportunities normally require a nomination/selection process that can be somewhat time consuming. The FSD should also insist that JFS personnel be available for transition to the JTF should the JTF be chartered.

The conduct of the JFS will require personnel with varied operational and technical skills. Past JFSs have indicated that a full-time core of personnel with technical expertise in the areas of military operations, test and evaluation, analysis, and engineering will probably be required. Additional personnel with skills in resource management, logistics, transportation, etc. may be required on a part-time basis. Some considerations for staffing are:

Feasibility Study Director should be an 0-6 (possibly a GS-15) with test and

evaluation experience and a sound technical background. While joint experience is desired, command experience is necessary due to the problems with establishing a new command. The requirement to brief flag levels also dictates an 0-6. Senior 0-5s are acceptable if they have promotion potential and the required T&E and technical experience. It is expected that the FSD will transition and become the JTD.

Military operations personnel who possess knowledge and experience in the operational aspects of the JFS subject matter will be required. These individuals should understand the concepts or issues from a joint perspective or at least from the perspective of their respective Services. They should also be versed in their Service's mission, doctrine, tactics, procedures, and systems that are applicable to the nominated concepts or issues. They should also be familiar with Service and Joint Staff exercise and training activities applicable to the JFS operational issues.

Test and evaluation expertise is an absolute necessity to the successful conduct of the JFS. Personnel must be experienced in concept development, analysis, planning, execution, and reporting of testing activities. This experience should include the identification of test events and locations; the development and management of test schedules and budgets; the identification, acquisition, and management of test resources; and data collection and management. These personnel should also be able to plan for test analysis, develop program test designs, develop test plans and procedures, and write reports.

Analysis personnel with experience in operations research, systems analysis, or related scientific disciplines and experience in the application of these skills to joint testing will be required. This experience should include developing test designs, defining evaluation criteria, identifying data requirements, using automated and manual analysis tools and techniques, and applying modeling and simulation techniques to satisfy analysis requirements.

Engineering personnel with testing experience may be required. This expertise may include the employment of test systems and the integration of test instrumentation system and associated interface equipment. Engineering experience is required to identify the technical parameters associated with obtaining data to satisfy the test issues/objectives and the types of instrumentation systems that will be required to collect the data.

Contractor personnel with a variety of JT&E background and experience may be required. The time allowed for a JFS precludes delays in obtaining qualified personnel, the training of unqualified personnel, or the inefficiencies inherent in the use of part-time or additional duty personnel. If the Service personnel systems cannot accommodate the JFS personnel requirements in a timely manner, the FSD must consider the use of qualified contractor personnel to support the JFS. Contractor support can be obtained by either modifying existing contracts or by using a DESA support contract. Either will involve the development, coordination, and approval of a task statement specifically addressing the JFS requirements. Managerial and technical support or assistance in

contract administration is available from DESA. The FSD should contact the DESA JT&E POC for such assistance.

Communications and Automated Data Processing (ADP) Support

The provision of adequate communications and ADP equipment is the responsibility of the support agent designated by the lead Service. The identification of equipment required and the requisition of this equipment are the responsibility of the FSD. Most organizations have some communications and ADP equipment on hand. The FSD should coordinate with the designated support agent to determine if equipment is available. DESA may be a source if the lead service support agent is unable to provide the required ADP support. DESA maintains an inventory of residual communications and ADP equipment from past JT&Es. Current JFS and JT&Es have priority of use of this equipment.

JFS communications and ADP capabilities should include at least some computers of the 486 class or higher to accommodate databases, planning, programming, analysis, and graphics requirements. FAX/modem capabilities are essential. Communications and ADP equipment that are not available from on-hand stocks may take four to six weeks to acquire, and this could impact the timely completion of the JFS. In any case, core communications and ADP requirements and the initiation of actions to lease or acquire this equipment require immediate action by the FSD. Leasing equipment is rarely cost effective for anything over a three-month period. The FSD should also consider follow-on JTF requirements in any decision to purchase

communications and ADP equipment; in all likelihood, the equipment will be transferred to the JTF if it is chartered.

Funds

The lead Service will fund those costs associated with the facilities, assigned and supporting civilian personal, and all administrative and routine logistical support. This is true even if the JFS is conducted at an industrially funded location. It should be noted that the cost to a lead Service will *increase significantly* for industrial funded locations. The participating Services will provide salaries for their JFS staff personnel.

The DDT&E disperses PE 0605804D funds in accordance with *DoD 7110.1-M, the Budget Guidance Manual (Chapter 251)*, to pay for costs that are unique to a JFS. *Unique costs include travel, per diem, and dedicated contractor efforts expended in support of the JFS.* OSD will initially provide these funds based on the resource estimates that were established in the nomination report to the SAC. Although this budget estimate was developed by the nominating sponsor and briefed as part of the JT&E PC and SAC decision processes, it should be revised by the FSD based upon updated JFS information. The revised budget estimate should be forwarded to DDT&E within 30 days following issuance of the JFS directive. The revised budget will include up-dated estimates separated into the major categories of travel, per diem, and contractor costs. The budget revision will be reviewed by the DDT&E and, after considering the financial impact and discussions with the FSD, revised funding will be set aside for the conduct of the JFS. DDT&E will then

provide funds, either in full or incrementally, for the duration of the JFS. The FSD will provide periodic or as required financial status reports to include commitments and expenditures by category and available funding balance. Further revision of the budget estimate will be as negotiated between the FSD and DDT&E.

The FSD is responsible for operating within the bounds of the approved revised budget. If there are expenses that are not in the revised budget, the FSD will obtain the concurrence of DDT&E prior to the commitment of funds. Service approval will be obtained for any expenses that are funded by the Services. If discussions arise relative to the funding of any JFS activity or support, the FSD should immediately contact the applicable JT&E POC for clarification and resolution.

The FSD should establish a relationship with the host installation comptroller early in the program to identify support needs for reimbursable programs and establish applicable fiscal accounts. The FSD should advise DDT&E and the appropriate Service agencies of these accounts so that OSD and Service fund transfers can be directed accordingly.

Managers at all levels in DoD track funds by the three phases in the accounting cycle: commitment, obligation, and expenditure. The FSD and JFS financial manager must, therefore, understand the phases, the impact of financial related actions taken upon them, and the documentation required to execute the financial programs and be able to report on the status of individual JFS actions in terms of the accounting cycle. The following is a brief overview of the three phases of fiscal accountability.

Commitment is an administrative reservation of funds evidencing an intent to incur an obligation. Commitments are based on firm requisitions, purchase requests, or allied documents that will require actual contracting actions, or other authorized written evidence that indicates intention to incur obligations. Commitments involve a certification of funds availability that attests that funds are currently available to cover potential obligations and that these obligations are proper and valid charges to the funds cited. Commitments are made against funds available for the period in which the obligation is to be incurred. Decommitments of funds should be accomplished to increase available funds anytime a requirement no longer exists, funds cannot be obligated within the prescribed time frame (fiscal year for Service funds and two years for OSD PE 06058D4D funds), or a credit commitment document is received.

Obligation is a documented transaction that constitutes a legal requirement for furnishing goods or services and a corresponding requirement to pay for those items upon completion or delivery. An obligation is the amount of an order placed, a contract awarded, services received, or similar transaction during a given period that will require payments during either the same or future periods. Obligations should be recorded only when documentary evidence supports the amount of the obligation. All obligation documents should be sent promptly to the servicing accounting and finance officer for recording once an obligation has been incurred. An annual appropriation is available for obligation only during the fiscal year specified in the appropriations act. In order to obligate an annual appropriation, the contract must be made

within the fiscal year to be charged against, the supplies or services must serve a bona fide need of that fiscal year, and the obligation cannot exceed the available allotment. Obligations may be incurred at any time during the period of a multiple year appropriation if the related action concerns an item authorized in the appropriation act and the obligation does not exceed the approved allotment.

Expenditure occurs when an invoice or similar document has been received and payment has been made against it to satisfy an obligation. Accrued expenditures are charges to an appropriation during a period that requires funds either be dispersed or set aside for payment. Expenditures accrue regardless of when cash payments are made and are recorded based on documentary evidence including bills of lading, contractor invoices, and obligating documents. A recordable accrued expenditure includes the amount of work accomplished in spite of the stage of completion, shipping status, or lack of acceptance by the Government.

The difference between the funding received by fiscal year and that portion which has been set aside as committed, obligated or expended is the available balance left to conduct operations during the lifetime of the funds. It is important to remember that the combined total of the available balance, prior expenditures, current obligations, and commitments can not exceed the authorized funding by source and appropriation. More importantly, it is a violation of public law (Anti-Deficiency Act) if expenditures and legal obligations exceed the available funding of each separate funding document. Additionally, funds can not be commingled, i.e. OSD and Service funds accounted for as one.

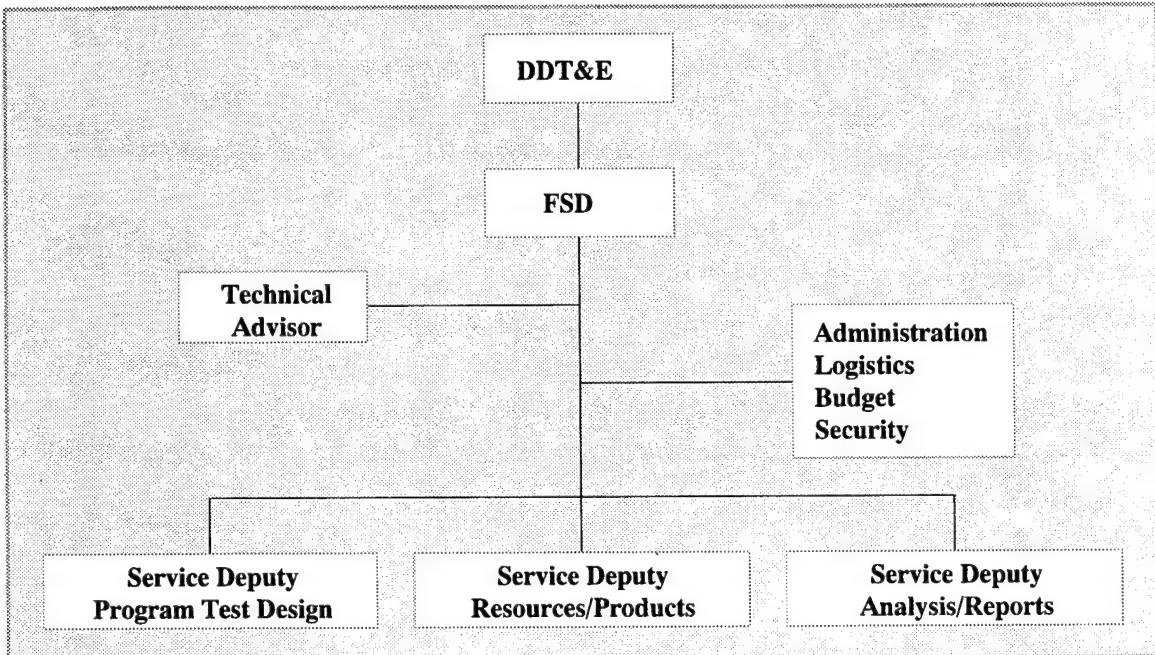


Figure 2-1. Example JFS Organization Structure

Organization

While most organizational structures can be tailored to accommodate a JFS, a simple structure that is based on JFS tasks or products will probably work best. The selected organizational structure should provide a clear chain of responsibility and accountability for each function, activity, task, or product. **Figure 2-1** is an example of such an organizational structure. The organizational structure should be tailored to take into account the unique nature and technical complexity of the JFS.

Because of the differences in the Services and the varied operational and technical backgrounds of the assembled staff, intolerance to broad ranges of ideas and opinions often develops within the JFS. It is for this reason that someone within the JFS should function as the focal point for resolving differences in technical ideas and opinions and maintain the focus of JFS

efforts on the directed mission. This can best be accomplished by the designation of a JFS technical advisor. In most cases the FSD will have the technical competence to function as the technical advisor. The FSD must recognize, however, that immersion in the technical aspects of the JFS sometimes is at the expense of management functions. In this case, the FSD may want to consider the establishment of a separate technical advisor position. It may be difficult to fill this position with Service or civilian personnel due to the JFS duration of less than a year and the uncertainty of chartering the follow-on JTF. The JFS should consider filling this position by competent contractor support, preferably from a contractor other than the primary support agent.

The FSD reports to the DDT&E and will be assisted by the Service deputies. The Service deputies should be responsible for major functions or divisions in the JFS organizational

structure. The specific responsibilities of the FSD and Service deputies are:

FSD

- Establish, organize, and supervise the JFS team.
- Lead, manage, and supervise all facets of the JFS.
- Ensure the JFS is conducted to accomplish its mission on schedule and within budget.
- Develop a JFS WBS and schedule.
- Maintain contact with applicable OSD/Joint Staff/Service committees, agencies, and support entities.
- Develop, maintain, and update requirements for OSD funding and Service support and submit these requirements to the DDT&E and the Services as appropriate.
- Control funds designated for JFS activities and account to the DDT&E for their use.
- Monitor Service expenditures related to the JFS.
- Prepare and submit reports as appropriate (in process review, final report, APA, JFS management report).

Service Deputies

- Ensure that their own Service concerns are adequately addressed by the JFS.
- Identify Service resource and personnel expertise required for execution of the JFS and ensure their availability.
- Coordinate within own Service to obtain required information and resources.
- Provide advice and expertise to the JFS on Service issues and areas of interest.

- Provide progress and significant action reports to their own Service.
- Obtain coordination of own Service relative to the feasibility and value of JFS actions, conclusions, recommendations, and products.

Security

Most JFSs will involve access to or the production of sensitive or classified materials. If so, the FSD must establish procedures for the complete security of JFS functions. These procedures should include considerations for the establishment of controlled access areas; the positive identification and control of personnel in the controlled access areas; the receipt, storage, transmittal, reproduction, and destruction of classified documents; the control of classified containers and the container combinations; communications and ADP security; personnel security clearances; and facility security checks. Service security manuals and *DoD 5220.22-M (Industrial Security Manual for Safeguarding Classified Information)* provide detailed information relative to the Government's Information Security Program and minimum requirements for safeguarding classified information.

If the JFS requires access to Sensitive Compartmented Information (SCI), the FSD must ensure that billets are available when needed through an existing Special Security Office (SSO) or DESA to support this requirement.

Security Classification Guide (SCG)

Another consideration associated with classified or sensitive projects is that of marking newly created documents. The classification of documents or portions of documents must be based on the information they contain or reveal. JFS classification authority will normally be derived from the original documents. If the JFS involves the development of classified material, contact the OSD JT&E Coordinator for assistance and information relative to establishment of

original classification authority. OSD security provides original classification authority in an annual memorandum issued each fall.

Each Service has its own unique requirements for Security Classification Guides. The JFS should use service-unique and established joint procedures when possible. If a SCG is needed, the FSD should contact the OSD JT&E Coordinator to obtain assistance and support for its development. An outline for a SCG that can be adapted to meet the needs of the JT&E is in Annex L.

CHAPTER 3

JOINT FEASIBILITY STUDY EXECUTION

A. INTRODUCTION

This chapter provides an overview of those activities and actions required to conduct a JFS, develop a test concept and APA, prepare the JFS final report, and provide recommendations relative to a follow-on JT&E conducted by a JTF. Part One addresses JFS execution. Part Two addresses the development of a APA. The FSD must focus on meeting the TAB and SAC in May and June with a fully prepared and fully coordinated JFS final report and APA. Part Three provides an overview of the program reporting requirements for the JFS. The FSD should not miscalculate the time and effort required to coordinate a JFS final report. It usually takes two drafts starting in January. The first draft serves to obtain Service comments and ideas and the second draft becomes the "For Record" version. Most of the time between the May TAB and the June SAC will be required to polish the JFS final report and pre-brief the SAC members.

It is important to remember that the primary purpose of a JFS is to provide those involved in the review and decision making process, specifically the SAC and DDT&E, with sufficient information to make intelligent and well informed decisions regarding the chartering of a JT&E. To this end, the JFS must address, in sufficient detail, the answer to two critical questions:

- *Is a JT&E necessary?*
- *Is a JT&E feasible?*

The Milestone I Review will concentrate on the necessary issue. If the JFS determines that the proposed nomination is not necessary, the FSD should present the JFS findings at that point. If the DDT&E agrees that *the JT&E is not necessary*, the JFS should be concluded, a JFS final report and management report should be prepared, and actions should be initiated to close out the JFS. The criteria for determining necessity are addressed in Section E of this chapter. The second critical question, *Is a JT&E feasible?*, should be addressed after the APA has been developed and the required test activities and resources have been identified and quantified. Detailed guidance for answering this question is contained in Section M.

PART ONE

JOINT FEASIBILITY STUDY

This part consolidates information, guidance, recommendations, and POCs to assist the FSD and staff in the execution of a JFS. The following are discussions based on techniques successfully used in previous JFSs. The FSD and staff should consider these techniques and tailor them to the specific requirements of their JFS.

B. REVIEW AVAILABLE DOCUMENTS AND UNDERSTAND THE NOMINATED CONCEPTS/ISSUES

The JFS is a discrete but integral and sequential part of the JT&E program.

Understanding the nomination process, the problem or situation that created the nomination, the recommended concepts and solutions, and who concurs with and who must directly support the JT&E is essential.

An initial step in conducting the JFS is to review and understand the documents that led to the nomination; these were generated during the nomination review, coordination, approval, and chartering process. Section B of Chapter 2 describes these documents. The FSD should contact the OSD JT&E Coordinator at the earliest opportunity for assistance in obtaining documents the JFS staff may not have. The OSD JT&E Coordinator can also provide assistance in obtaining current copies of the JT&E Procedures Manual, the JFS and JT&E Handbooks, Service JT&E support directives, and the JT&E support Memorandum of Agreement (MOA). Further, the OSD JT&E Coordinator can assist in determining what documents in the JT&E library may be of interest to the FSD and assist in obtaining them.

The JFS staff must become knowledgeable of the nominated concepts, issues, and objectives, to include background information, because they provide real world dimension to the situation or problem. Nominations are frequently manifestations of localized situations. Thus, the FSD and staff must quickly become experts on the proposed JT&E while retaining an unbiased and joint focus on the situation, problems, policies, directives, regulations, and doctrine associated with the nomination.

The FSD should remember that the purpose of the JFS is to address a concept or an issue whose resolution is unknown at the start. *The*

JFS must be an objective evaluation of the concept or issue, and the director and staff should not become advocates of the concept or issue solution. Such advocacy may either preclude critical analysis or invite improper balance (desirable features investigated while possible shortcomings ignored) by the JFS staff.

C. DEVELOP THE JFS WORK BREAKDOWN STRUCTURE AND SCHEDULE

In addition to the revised budget estimate described in Chapter 2, the FSD should refine the JFS schedule that was developed during the nomination process. The FSD should develop a WBS and schedule that are based upon updated projections of required JFS activities and available resources, then revise the JFS schedule accordingly. The revised schedule should identify milestone reviews at specific phases of the JFS, and the FSD should forward the proposed schedule revisions to the DDT&E within 60 days after issuance of the JFS directive for approval. The progress of the JFS will be based on the approved revised schedule. Subsequently, any significant changes to the schedule should again be coordinated with the DDT&E. **Figure 3-1** is an example of a JFS WBS/schedule. Milestone reviews are suggested at issues solidification, development of the test concept, and upon completion of the APA and final report. The JFS WBS and schedule in **Figure 3-1** must be tailored to the specific requirement of each JFS. In essence, the revised schedule of JFS activities and milestones becomes the JFS management plan.

JFS ACTIVITY	Months									
	1	2	3	4	5	6	7	8	9	10
Organize Facilities Staff Comm/ADP Contracts JFS Plan/Schedule Formalize Coord Chain	→									
Planning										
Determine if Necessary Develop Concept Fully Develop Issues Scope Test Scenario Measures/Data Elements Data/Analysis Methodology Program Schedule Resource Requirements Determine if Feasible	→									
APA										
Consider Alternatives Expand Concept to APA										→
Final and Management Report									→	
Prepare Coordinate Distribute										→
Close Down/Transition										→

Tailor JFS Activities/Allocated times

- Technical Complexity
- Available Staff

Figure 3-1. Example of Joint Feasibility Study WBS/Schedule

D. DETERMINE OSD/JOINT STAFF/SERVICE COORDINATION, SIGNATURE AUTHORITY, AND POCs

One of the first requirements for the Service deputies will be to determine and establish the coordination chain, POCs, and signature/coordination authority of their Service for JFS documents. The Service deputies should coordinate with their headquarters JT&E POCs to determine the organizations and agencies with primary interest in the JT&E. They then should coordinate with these organizations and agencies to determine

their POCs. Each of the POCs should be asked to determine and identify who within their organization or agency has coordination and signature authority for JFS documents. The FSD should also task one of the deputies to establish a similar OSD and Joint Staff coordination chain. Once formalized, these chains should be consolidated into a published formal JFS coordination chain. The chain should be used exclusively during the coordination cycle for JFS documents. Time dictates that these chains be established quickly. Establishing these chains early and using them religiously will help the JFS to achieve its goals on schedule.

A complete listing of POCs' offices on the coordination chain, to include mailing addresses, message routing addresses, office symbols, and civilian autovon telephone numbers, is an essential part of the process and must be developed as soon as practical.

The FSD should realize that it may become necessary to revise the coordination chains as the JFS progresses. The FSD should welcome suggestions and ideas from all involved organizations, but should avoid expanding the formal coordination chain outside of those directly involved or affected by the JT&E program and the proposed JT&E.

A major problem for previous JFSs has been that as new personnel and organizations are included in the coordination chain, many want to restructure the program to include special interests. This occurs because the coordinating individuals are not totally familiar with the JFS directive, some interpret the directive differently, and some may not be aware of previous discussions and negotiations. Significant time and effort have been expended by previous JFSs responding to these recommended changes and revisions. Efforts should be taken to avoid these types of actions.

E. DETERMINE IF A JT&E IS NECESSARY

The next step would be to determine whether the nominated JT&E is necessary, for if it is determined unnecessary, there is no reason to carry the JFS any further. JT&E nominations can vary from evaluations of concepts or operational use of new or improved equipment, techniques, and procedures to proposed solutions

to specific problems. Therefore, the following is a general discussion on what should be done to answer the question, *Is the JT&E necessary?* This question should be resolved by evaluating the nomination in terms of five criteria, and the JFS should substantiate and document that each criterion supports conclusion as to whether a JT&E is necessary:

- 1) *Do the nominated concepts or issues and objectives meet one or more of the stated purposes of a JT&E? (See Chapter 1, Section B)*
While the nomination, coordination, and selection process should preclude non-joint issues from reaching the JFS stage, there is the possibility that an issue that originally appeared to be joint may subsequently prove not to be. Jointness is an absolute requirement and is not waivable.
- 2) *Are the issues and objectives joint and do they require joint efforts and solutions?*
3) *Are the issues being addressed elsewhere?*
The JFS may find that the nominated issues are already being addressed by other agencies or that these agencies could incorporate the issues into ongoing or planned activities.
- 4) *Is the problem of sufficient magnitude or significance that it warrants expenditure of the estimated resources?*
- 5) *How likely is it that the Services will implement or use the JT&E results?*
Identification of the user who will actually use the JT&E products is essential.

The JFS should be creative in determining how each of the five criteria will be derived and used to resolve the question of necessity.

Does the nomination meet one or more of the stated purposes of a JT&E?

The JT&E program formally brings two or more Services together and provides specified funding to address joint matters and resolve joint issues that cannot be effectively addressed or resolved through independent Service actions. As discussed in Chapter 1, the purpose of the JT&E program is to: 1) assess the interoperability of Service systems in joint operations and explore potential solutions to identified problems, 2) evaluate and provide recommendations for improvements in joint technical and operational concepts, 3) develop and validate system development and testing methodologies having multi-Service applications, and 4) evaluate technical or operational performance of interrelated/interacting systems under realistic joint operational conditions. This aspect of joint testing will likely become more important as systems and sub-systems are upgraded with new technologies or as new technologies are fielded off the shelf.

Is the nomination joint? Service downsizing has increased the probability that U.S. involvement in contingency responses will be of a joint nature, and support of these contingencies requires that the U.S. develop more flexible joint response capabilities. It may be necessary for theater commanders to insert joint responses into a variety of situations that could range from disaster relief to opposed military operations. In fact, joint and combined task force response operations now dominate our employments. The JFS should, therefore, evaluate the joint aspects of the nomination in terms of potential and probable joint scenarios; for example, no threat situations (disaster relief), low threat (Grenada), ambiguous threat

(Somalia), or opposed operations (Kuwait). It is probable that most JT&E nominations will involve military operations or support of military operations and that these operations will be joint.

Can the nomination be addressed elsewhere? The JFS must determine whether the nominated concepts or issues have been or could be addressed by other joint, Service, or OSD agencies. Most joint test programs could be addressed by alternatives such as a Joint Program Office (JPO) or by expanding the activities of existing OSD or Service agencies and organizations. The discriminator for a JT&E is that it involves fielded or soon to be fielded equipment used in a new, enhanced, or broader joint environment or concept of operation. Once a concept has been proven to be workable by a JT&E, it could be passed to an acquisition office for applicable development and/or acquisition.

The JFS must also determine if the issues of the nomination have been, could be, or are being addressed through other efforts or whether current or future activities of these organizations or agencies could be modified to address the issues of the nominated JT&E.

The JFS should also determine whether the nominated issues are the result of practices or procedures in related programs that could be resolved by changes in those programs. For example, a nomination involving electromagnetic interference problems could turn out to be the result of ineffective frequency allocations during system acquisition or the result of ineffective frequency assignment and control during field operations. The JFS may have to interface with related programs to identify the real problem and in turn address the most realistic solution. The

JFS should determine not only whether the nomination can be addressed elsewhere but, if so, who has responsibility for resolution. Some of the related projects may involve special access programs, in which case the FSD must rely on the DDT&E staff to identify and assist in obtaining access.

Does the proposed JT&E warrant expenditure of the required resources? JT&E issues are usually recommended by organizations that have seen some facet of the problem but may not have a global understanding of the situation. While the concepts, issues, and objectives may reflect critical unresolved problems, the proposed solutions may reflect either isolated circumstances or parochial interest or biases. Staffing and coordination during the nomination process provides a multi-Service perspective of the nomination, but normally not at the level of detail that is required to fully evaluate and substantiate the nomination in terms of the magnitude and joint significance of the situation or problem. This substantiation should involve determining the frequency and distribution of the deficiency. The JFS should also base this determination on the probability and number of occurrences under potential employment situations. Based on this analysis, the JFS should consider whether the proposed concept or solutions are credible and warrant expenditure of the estimated resources that will be required. A key part of this consideration is developing the estimate of resources required, which is discussed in detail in Chapter 4.

Are the Services and/or Joint Staff likely to implement or use the JT&E results? This criterion is an assessment of Service support expected relative to

implementation of the JT&E proposed solution. The level and extent of Service coordination during the nomination process is a starting point for this determination. The proposed solution may, however, involve Service or Joint Staff policy or doctrine issues, and these must also be considered. For the most part, this evaluation will be based on contacts with Service and Joint Staff representatives, inputs from the Service deputies, and how confident the FSD is in the credibility of the concept or solution proposed in the nomination.

During this evaluation, the JFS should also determine what the users require as a results output. Do they wish results only or do they require recommendations for revised procedures, etc? The JFS should define what the JT&E legacy products will be and identify who will be the users of these products. Evidence of support to use the JT&E products at the 2/3/4 star level is necessary and is not difficult to obtain if the products are worthwhile.

F. FULLY DEVELOP THE JT&E CONCEPTS, ISSUES, CRITERIA, AND OBJECTIVES

The JFS should fully develop the nomination concepts and issues and coordinate them with the responsible organizations and agencies that are, or will be, involved in the JT&E. This is the most critical task that the FSD will undertake. *Failure to solidify the concepts, issues, and objectives at the very start of the JFS will impact on all subsequent tasks and activities the JFS undertakes.* This step is more than fundamental, it is essential. The JFS will simply bog down without meaningful progress if the

concepts and issues are subject to continual change or revision. This is not to say that concepts and issues cannot be changed, only that such changes should occur only when substantiated as necessary. The DDT&E, with the advice of the TAB, is the approval authority for all such changes.

The JT&E issues must be well articulated to convey what exactly the JT&E plans to evaluate. The JT&E should have a well defined concept that it plans to evaluate; failure to articulate a well defined concept has been the downfall of some JTFs.

The FSD should have been involved in the JT&E PC process and should be familiar with the nomination concepts, issues, and objectives and the coordination actions that occurred during the nomination process. *If the FSD was not involved in the JT&E PC, he must quickly become an expert on the nomination and its concepts, issues, criteria, and objectives.*

Concepts

Concepts are basically perceived ways of doing something and include combinations of systems, equipment, procedures, and personnel that will be used to accomplish the intended task. JT&Es that concentrate on concepts involve equipment and systems used in a new or different environment, procedure, or operation. A JT&E of a revised concept will usually include a comparison of the revised and the old concept and the quantification of observed changes in operational capabilities. Advances in technology frequently provide the opportunity to develop new concepts with significant increases in

operational capabilities, reliability, flexibility, and mobility while reducing resource requirements. A JT&E of a new concept will also include an evaluation of the technical maturity of the concept's components, the risks associated with each, and a projection of its capabilities and effectiveness.

Issues

Issues are questions that must be answered relative to concepts, procedures, system interfaces, or systems capabilities to resolve multi-Service problems or address multi-Service needs. They address the tasks and areas of risk that most significantly affect mission accomplishment. They are not parameters, thresholds, or objectives. Failure to resolve these issues renders the system in question unresponsive to the needs of the user. Issues are normally written as specific questions. The issues in the JFS directive reflect the problem or concerns as seen through the eyes of the nominator. Joint considerations at this point in the JT&E cycle are frequently without the benefit of a detailed review or study.

Full development of the nominated issues should include the development of a problem or need statement and an issue justification paper that substantiates the magnitude and scope of the problem. The FSD will find that a clear and concise problem statement and issue justification paper will greatly assist in the coordination of issues and objectives. Formulation of the problem statement should consider all aspects of the problem to include *doctrine, policy, logistics, and operations*. Interfacing with those agencies and organizations responsible for these functions will facilitate the development of

a realistic definition of the problem. Once the problem has been identified, the solution to the problem should be scoped to that which is meaningful and is achievable during the life cycle of a JT&E. The issues should be worded in terms that are simple and relevant. Decomposition of the issues into subissues or even sub-subissues may be necessary so that all can be clearly defined in terms of associated measures and tasks that must be accomplished. The ideal situation would be one issue that defines one measure that defines one task. This situation seldom occurs. The principle of simplicity and direct traceability of issues to subissues, to measures, to tasks should be used as a guide in the full development of issues.

Criteria

Criteria are statements of required technical, effectiveness, suitability, and supportability performance. Criteria are frequently expressed as thresholds that provide the basis for collecting data that is used to evaluate/answer the issues. Criteria should be unambiguous and assessable, whether stated qualitatively or quantitatively. Criteria are the values deemed necessary by the user of the concept or system. Criteria are used to:

- Support measures that compare the mission performance of the new system or procedures to that being replaced.
- Compare new concepts, test items, or procedures to a predetermined standard.
- Compare mission performance using the new concepts and test items.
- Compare procedures to operations without them.

Objectives

Objectives should be designed to define those areas in the JT&E that require or involve activities to gather data required to evaluate concepts or answer issues and measures. For example, if a JT&E issue is *"What is the best vehicle for a specific joint force element?"* the objective will be "to develop and execute test activity xx that provides sufficient data to determine what is the best vehicle for the joint force element." When the JT&E objectives are clear, the test methods and approaches for achieving the objectives will be understandable. Clear objectives define the nature of the JT&E activities and influence the development of the test measures.

G. COORDINATE AND SOLIDIFY THE JT&E CONCEPTS, ISSUES, CRITERIA, AND OBJECTIVES

The JFS must coordinate the concepts, issues, criteria, and objectives with the organizations and agencies that are involved in or will be involved in the JT&E to obtain their concurrence. *This coordination may involve considerable negotiations, because many of these organizations and agencies will attempt to restructure the JT&E and, in turn, the issues during the coordination process.* A technique that has been used to minimize the effects of this dilemma is to obtain coordination comments from each organization or agency, insisting that the coordination be at an appropriate level to speak for the organization, incorporating as many comments as possible, and presenting the revised concepts or issues and objectives to all coordinators at a conference for resolution of the

differences. Coordination is easier when conducted under conditions where differences are aired before a group of interested and knowledgeable representatives. Of importance here is that the conference participants be knowledgeable of the proposed JT&E and their organization's original input and be able to speak for their respective organizations. The FSD should coordinate in advance to assure the right personnel are invited, that the meeting place and date are convenient and acceptable, and that the unit representatives understand what is expected of them.

The JFS must coordinate the review of the proposed APA and associated operational concepts and potential changes to joint and interservice doctrine with the Air Land Sea Agency (ALSA) and the Joint Doctrine Center (JDC). Depending on the magnitude of the impact that the JT&E could have on doctrine, representation from ALSA or the JDC may be desirable or required at the General Officer Steering Committee (GOSG) or other appropriate advisory group or panel. The FSD and JTD must solicit ALSA and/or JDC's input on test results, recommendations, and transition of legacy products that have or may have an impact on joint doctrine, tactics, or procedures.

Once the concepts, issues, and objectives have been fully coordinated through the established chains of command, they should be approved by the DDT&E and used as the foundation for all subsequent JFS tasks, activities, and milestone reviews. OSD level coordination should be the final step in the coordination process. The FSD will schedule an in-process review (IPR) to review the study

progress and obtain the DDT&E approval of the fully coordinated concepts, or issues, and objectives. If an IPR is not practical, the FSD may submit them in writing directly to the DDT&E for approval.

Remember, these approved concepts, issues, criteria, and objectives become the basis of all future JFS activities, reports, and reviews. This is not to say that changes and revisions should not be considered. However, when changes and revisions are justified, they should be coordinated with the appropriate OSD/Joint Staff/Service organizations and agencies and be approved by the DDT&E so that focus remains on the chartered task. If significant changes or revisions are visualized, and they will impact the JFS schedule, the FSD should immediately apprise the DDT&E of the situation and provide alternative solutions.

H. SCOPE THE JOINT TEST & EVALUATION

As pointed out in the determination of "*Is the proposed JT&E necessary?*" the test concept and APA should consider all facets of the nominated concept or problem, to include such things as deployment phases (in garrison, en route, deployed), levels of threat (none, low, ambiguous, opposed), etc. These considerations frequently result in a very large test concept that is neither practical nor achievable. Down-scoping the JT&E concept or proposed solution may be required to assure that the JT&E addresses only those facets of the problem and objectives that are germane and achievable within the prescribed time frame and available resources.

There are a number of scoping techniques that have been successfully used in previous JFSs. Most involve dissecting the problem to identify and isolate those critical issues that relate directly to a solution to the problem. The JT&E test concept would then concentrate on those critical issues. Scoping should also consider test methods that make maximum use of available data from archives or other test sources. Testing should be limited to those situations where data is essential and cannot be otherwise obtained. Scoping the JT&E concept will involve two other considerations: assumptions and limitations/constraints.

Assumptions

The test concept cannot be designed to include all possible combinations of variables (targets, weapons, tactics, command and control, threats, environments, weather, light conditions, etc). The JFS must, therefore, develop assumptions that scope the JT&E concept to something that can be achieved within three years. The following are examples of assumptions from several previous JT&Es that can be considered as appropriate for this scoping action:

- The scenario and test cell matrix bounds the JT&E to critical issues and achievable test conditions.
- The JT&E concept may require that surrogate targets and weapons be used.
- The JT&E concept may involve notional defenses or forces.
- Equipment, techniques, and tactics may be limited to currently fielded systems or represent future equipment/forces.

- The JT&E concept may address only certain weather or day/night environments.
- The JT&E concept does not attempt to optimize developing techniques/technologies.
- Live ordnance will not be used.
- Kill removal is not a concept consideration for this JT&E.
- Test participants will represent fielded units.
- Validated modeling and simulation inputs or results are considered realistic and will first be utilized to predict actual test results then in lieu of or to extend test results.

Limitations and Constraints

Limitations and constraints will primarily be related to real world test environments (resources are limited, scarce, or not available; unacceptable or unavailable training requirements, range scheduling; operations; safety and environmental concerns; etc). The following are examples of limitation and constraint considerations:

- A full factorial evaluation of potential test variables is not possible. Pairings in the test cell matrix are based on those issues that are considered to be the most important.
- Not all required resources are available.
- Surrogate resources may not be fully representative.
- Range and safety limitations preclude full replication of combat environments.
- Environmental considerations preclude full use of a technique or system.
- The JT&E concept does not address all systems in the U.S. or threat inventory.
- "Piggybacking" on training activities does not totally meet all test requirements.

- Funding or time preclude satisfying all test requirements.
- Available technologies, models, or simulations are not fully mature or verified and validated

avoid, if at all possible, the need to develop a unique scenario.

I. DEVELOP THE JT&E SCENARIO

Most nominations are based on operational situations, and the resolution of the identified problem should be related to that or a similar operational and environmental situation. The FSD must identify a test scenario for the test activities that can be directly related to the environment of the nominated concepts or issues. The scenario must consider, as a minimum, operational concepts (if an issue rather than the concept is being studied), force structures (size of friendly and adversary forces), laydowns (realistic force component locations), rules of engagement, terrain, tactics, and timing. Further, the scenario should be based on situations that conform to those in our defense planning guidance.

There are a number of sources that can be used to select or establish the required scenarios. The *Unified Commands, Joint Publication 3-03 (Joint Interdiction Operations)* and the *Joint Military Net Assessment* are sources of validated scenarios that can be adapted to fit the needs of the JFS. The use of an existing validated scenario, or a subset of a validated scenario, is recommended whenever possible. Defense Intelligence Agency (DIA) validation of a modified scenario is required and may take some time. If none can be found that satisfy JT&E concept requirements, the JFS may have to modify one and initiate the required actions to obtain DIA approval. *The JFS should*

Most joint test scenarios and activities will include the requirement for a realistic operational environment that involves the use or creation of realistic threats. Here again, the primary source of threat information is DIA. *DIAR 55-3, Intelligence Support for Defense Acquisition Programs*, should be used as a guide to obtain threat information support.

J. DEVELOP THE JT&E CONCEPT

Time constraints dictate that the JFS team quickly concentrate their efforts toward a singular goal: to develop a JT&E concept as the initial step in formalizing the APA. The JT&E concept is basically a structure that describes the *who, what, where, when and why* of the proposed JT&E. It provides the links between the issues, areas of risk, measures, test methods, and the data collection and analysis process. The JT&E concept is used as the vehicle for determining the most effective way to execute the proposed joint test. When the JT&E concept is agreed upon by the TAB and the DDT&E, it will be expanded upon and formalized to become the APA. A structured approach should be used to develop a concept that will accomplish the JT&E objectives and, in turn, resolve the JT&E issues. This structured approach begins with the definition and development of the evaluation methodology. This methodology will establish a high level definition and agreement among JFS participants and supporting agencies of the general and realistic parameters of the supporting evaluation. This methodology will be a useful tool to bound the definition of test measures and subsequent waterfall of test details. This process

will involve a number of closely related activities that must be considered and developed simultaneously. These are:

- A rigorous translation of the issues to test measures and, in turn, to test data elements (dendritic structure).
- An approach for resolving the JT&E issues.
- The development of a test method matrix.
- The development of a test cell matrix.

Figure 3-2 is an example of a JT&E concept that shows the overall relationship between the issues, test methods, and products. **Figure 3-3** is an overview of the steps commonly used in the concept development process. The JFS team will use the JT&E concept to define the analysis techniques and methodologies that will be used for consolidating the test results to resolve the JT&E issues.

Develop the Dendritic Structure

The dendritic process is nothing more than a structured process for identifying all of the elements or actions necessary for addressing or resolving the concept or system issues. The process also provides the underlying structure for the program level analysis approach and methodology. A key component to the process is *linkage: all data collected using the various test methods is required and has a place in satisfying the issues.* This linkage assures that only required data is planned for and that resources will not be wasted by planning unnecessary activities or collecting

unnecessary data. Verification of this process is sometimes known as a data trace. An incomplete dendritic structure may not yield enough information to adequately address the issues. Worse yet, an incomplete structure may result in false conclusions drawn from incomplete sets of information.

To develop the dendrite, the JFS team must "decompose" the issues to their lowest level by asking "*What must I know to address or resolve each issue?*" The answers have attributes that can be used to develop the next level of questions. When the attributes reach a level that can be quantified, this next level is called measures. The criteria for quantifying these measures are expressed in terms of what the system or concept is required to do. Three levels of measures are commonly used to relate system or concept attributes to the required task to be performed: the overall mission, systems capabilities in terms of task accomplishments, or systems capabilities in terms of characteristics or attributes.

For each measure, the next level is the data elements required to calculate the measure. When this data element level is reached, *What I must know?* is a measurable quantity. This measurement can be obtained either from existing data resources or, if truly unique and unavailable, through some degree of actual testing. This process of breaking the issues down to the data element level represents the development of a dendritic structure. **Figure 3-4** is an example of a simple dendritic structure.

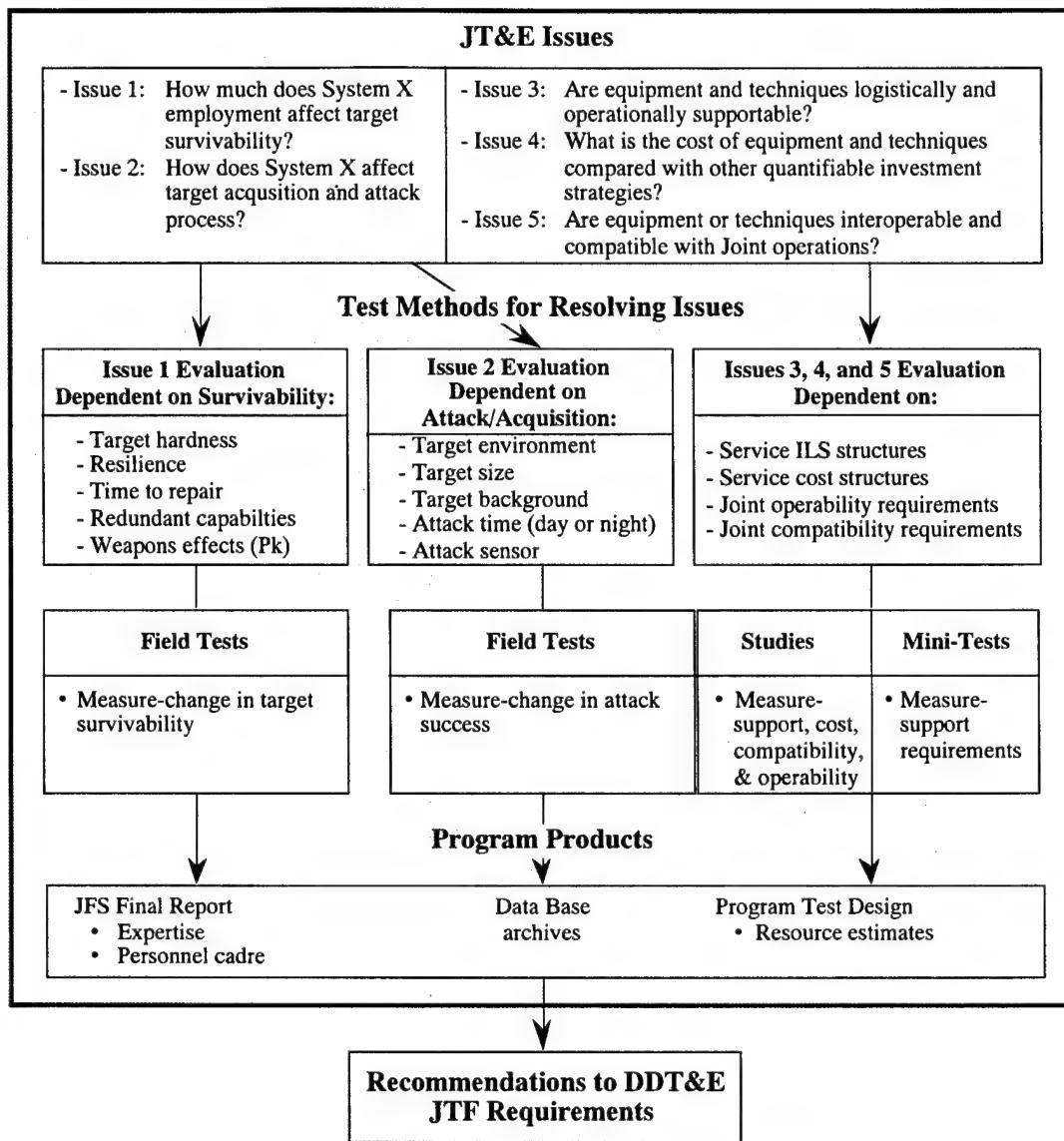


Figure 3-2. Example of a JT&E Concept

Since the data elements for the dendritic structure constitute the entire data requirements for the JT&E, the dendritic process requires a thorough, in-depth knowledge of all concepts or issues in order to identify all the information necessary. For problem solving issues, this equates to an organized sequential approach for gathering needed data, developing hardware or software processes, implementing problem solving techniques, or combinations of these approaches.

Inherent in the process of developing the dendrite is the identification of the analysis methods required to convert data elements into measures and then to information required to answer questions at the issue level. The JFS must document the required analysis methods as the dendritic structure is developed because they form the basis for the program-level analysis. Further, the complexity of the program-level analysis will likely parallel the complexity of the dendritic structure.

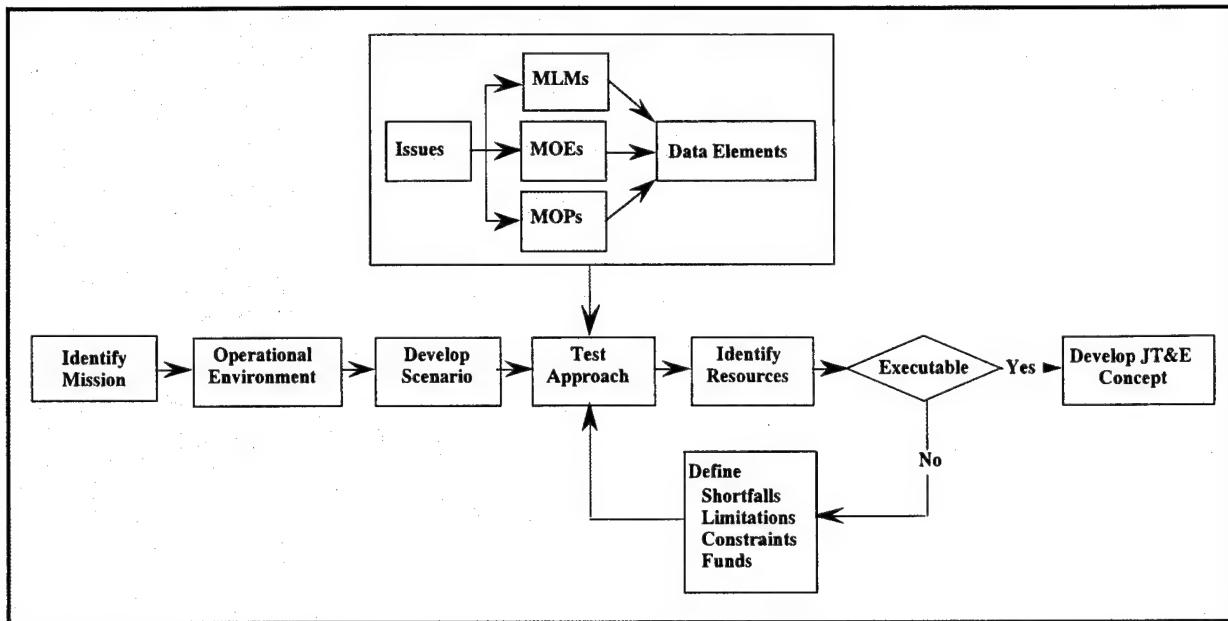


Figure 3-3. Examples of Steps in the JT&E Concept Development

Develop the JT&E Measures

Annex E provides a more detailed explanation of the most commonly used process to analyze and fully develop the test issues. In this process, the JFS will develop criteria and measures for each of the issues or subissues as a way of relating the results of testing to resolve the issues. There are three commonly used types of measures: *mission level measures* (MLMs) relate the effects of a concept or system to the mission that the concept or system supports; *measures of effectiveness* (MOEs) are used to measure a system's effectiveness in the accomplishment of a task; and *measures of performance* (MOPs) are used as a quantitative or qualitative measure of system or system component, capabilities or characteristics. All

measures must be derived from quantifiable test data that characterizes the extent to which some test objective has been achieved. A description of each measure should be developed that defines specifically how it will be calculated.

Mission Level Measures measure concept or system capabilities in terms of the effects of these capabilities on the overall mission of which the concept or system is a part. Most will be measures of mission or system attributes that must be defined in terms of measurable qualities. An example of an attribute for a command and control (C²) system would be reliability, and an example of a measure for reliability could be operational failure mean time, operational mission mean time, unscheduled maintenance mean time, etc.

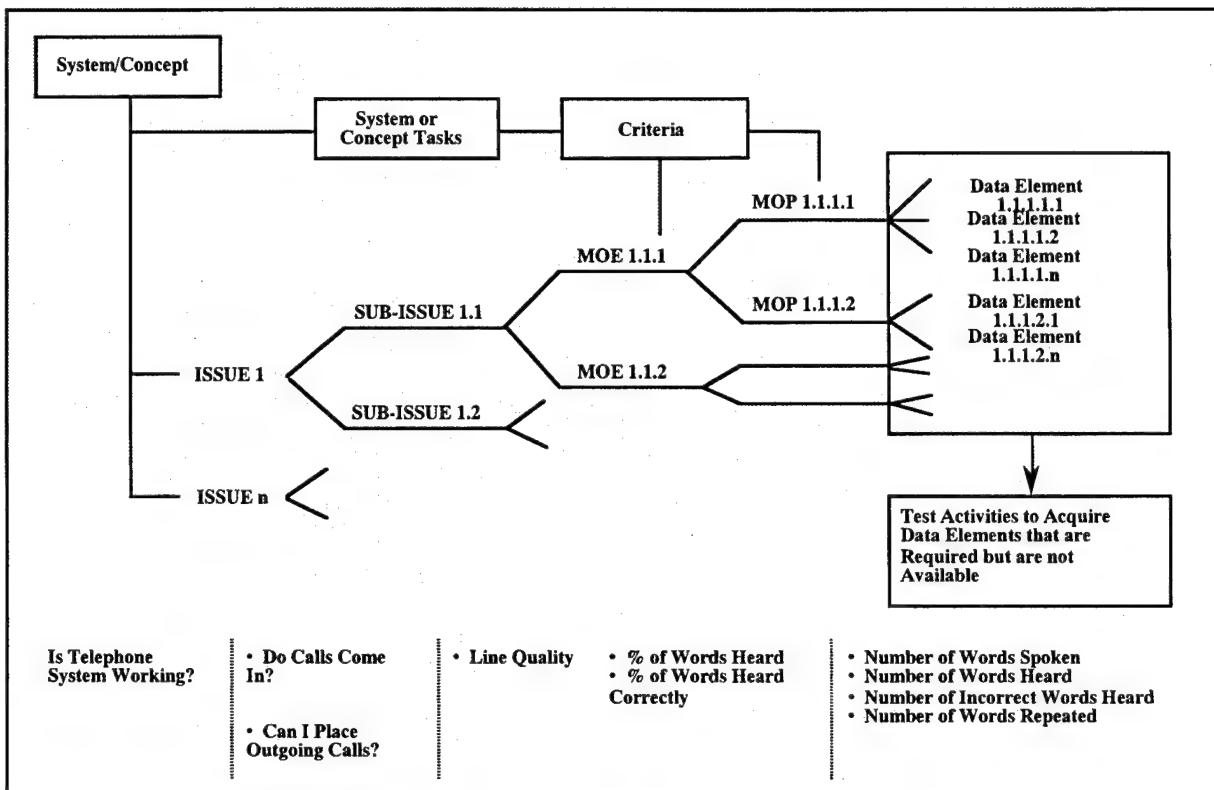


Figure 3-4. Example of a Dendritic Structure

Measures of Effectiveness measure concept or system capabilities in terms of task accomplishment or system attributes. Most JT&E nominations involve concepts or systems that can be related directly to operational capabilities in terms of engagement or battle outcome. For those systems that cannot be directly related to operational capabilities, the developed measures should be expressed in terms of concept or system attributes. For example, C² system measures can be expressed in terms of capacity, consistency, timeliness, accessibility, completeness, accuracy, transportability, and security. The measures should then be developed to levels of specificity so that the C² system can be evaluated both in terms of effectiveness and suitability. MOE evaluation criteria should be quantitative if at all possible.

Measures of Performance are quantitative or qualitative measures of a system's capabilities or characteristics. They are used when it is difficult to directly test an MOE or to establish quantitative criteria. In these cases, MOPs are developed that can be aggregated at the MOE or issue level. MOPs should be quantitative whenever possible. Quantitative MOPs are measures of system performance that can be related to some numerical scale; for example, a communication system throughput. Qualitative MOPs are categorical measures of system performance that refer to the presence or absence of system characteristics. Usually subjective measurement techniques are used to address qualitative MOPs. Qualitative MOPs are based on system characteristics that are defined by the needs of the user or meet user-defined system performance requirements.

Derived Measures, in some cases, may be required to resolve an issue. Derived measures result from analysis or manipulation techniques (such as simulations, aggregations of many scores, extrapolations, etc). They may be the only or most effective way to fully address a JT&E issue. For example, JT&E tests that do not employ live ordnance could include the use of the Joint Munitions Effectiveness Manuals (JMEM) to convert weapons miss distances to target damage estimates and, in turn, to target survivability.

Define the Required Data Elements

A thorough development of the JT&E measures will allow determination of the specific data elements that will be required to answer the measures. Normally, these data elements will remain constant between test activities, but the methods for obtaining the data may vary. The JT&E concept must consider the required capabilities to acquire this data in terms of source, type, format, sample rates, and collection methods. It must also consider the availability of data extraction points, instrumentation, test controls, documentation of uncontrolled test variables, and the interface that will be required between instrumentation, the test facility, and the JT&E test team.

As mentioned previously, the individual data elements are derived through a dendritic process that divides issues into subissues and subissues into progressively finer subdivisions until directly measurable data elements emerge. Ordinarily, this results in a large, complex root-like structure. It is usually most convenient to conduct this iterative process in the form of a blackboard exercise because of the numerous

changes that are expected during the initial breakdown. Conducting this exercise is usually one of the more demanding tasks of the JT&E process. When the final derivation of data elements is complete, the FSD selects data elements necessary for testing.

Often, one aspect of an issue has several possible data sources, with not all of them being needed. However, some redundancy is desirable, especially when a data element can only be gathered by sophisticated instrumentation that may be subject to failure. In most cases, this instrumentation would be backed up with a simpler, manual measure. Additionally, there may be duplication of data elements obtained while exploring very different aspects of the JT&E concepts and issues. This duplication may be desirable in case the primary source should fail or the testing be canceled or changed. As stated, the selection of data elements to be tested is an especially demanding task. It also involves the risk of selecting inferior data elements. Therefore, it is advisable to seek the aid of specialists and subject matter experts (SME) during this process. It is necessary that the data elements be defined in sufficient detail to support the identification and quantification of JT&E resource requirements.

The above process also attempts to resolve the three points that are critically relevant to a JT&E: adequacy, quality, and credibility. *Adequacy* refers to completeness in addressing the JT&E issues or concepts. If a JT&E failed to address the issues, it was a failure in that an amount of uncertainty associated with the concepts, procedures, system interfaces, or system capabilities was not identified and reduced or corrected. *Quality* is associated with

the relevance of the issues addressed. Right answers to wrong questions must be avoided. If improper or inadequate data are chosen, the JT&E will not provide the necessary information to decision makers. Tests will have to be redone, causing both schedule and cost impacts. This represents significant risk to the program. JT&Es must provide information that is clear and accurate beyond a reasonable doubt. *Credibility* refers to the degree to which issues, concepts, procedures, or system capabilities are examined and assessed. Proper test planning and conduct, along with aggressive follow-on evaluation, are critical to supporting credibility.

Define the Evaluation Procedures

Evaluation procedures are the methods used to reduce the data to information that decision makers can use. Concepts and issues that must be addressed by a JT&E are often distanced from the actual data collected. In effect, specific and valid evaluation procedures tie the tiers of the dendritic hierarchy together, ultimately to form a critical link between the top tier (concepts and issues) and the bottom tier (data elements). Without this link, the data collected is useless. Statistical processes, numerical analyses, and subjective assessments are all legitimate evaluation methods; however, no method is universally applicable or reasonable. For example, a test activity that collects a large number of data points typically lends itself to statistical processes, yet a test activity that yields a single data point is virtually impossible to evaluate with statistics, but is nonetheless significant. In the single data point case, a subjective assessment may be the only viable evaluation procedure.

The reality is that the complexity of the hierarchy from concepts or issues to data elements drives a corresponding complexity in evaluation procedures. The data derived at the lowest level must be evaluated to arrive at a result or factor that, when combined with other test results or factors, must likewise be analyzed and evaluated. This process is repeated at each step upward through the hierarchy to arrive at evaluated information that the decision makers can act upon and that is applicable to the issue or concept as a whole.

Develop an Approach for Addressing the Concepts or Issues

The JFS should develop an approach for addressing each of the nominated concepts or issues. These approaches should address the requirements for test activities in the three phases of all tests: pretest, test, and posttest. **Figure 3-5** is an example of an approach for addressing a test issue. The pretest phase identifies and defines those activities required to conduct the test activity, establishes the test parameters, and identifies instrumentation and support requirements. The test phase identifies and defines those activities associated with test execution and the collection of data required to support the test measures. The posttest phase identifies and defines those activities associated with the reconstruction and validation of the test data, the analysis of the data collected, and how the analysis will be used to address the concepts or issues being studied.

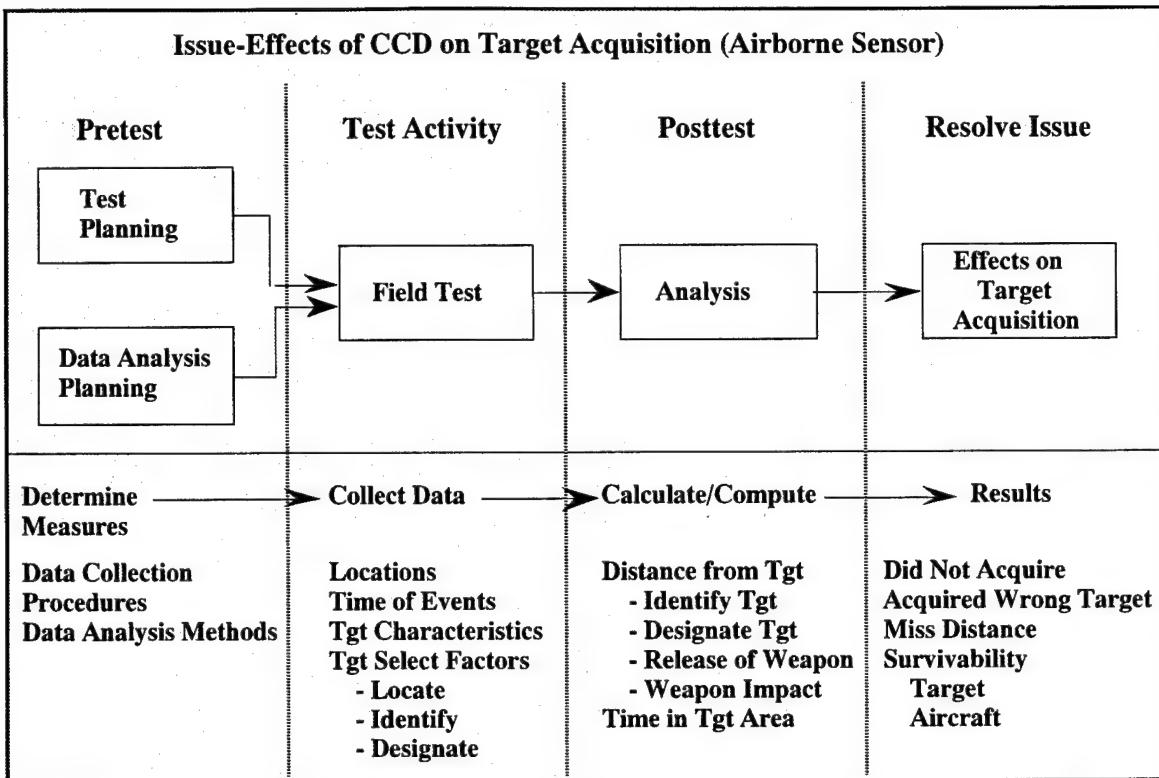


Figure 3-5. Example of an Approach for Addressing an Issue

Define Test Methods

Each of the required activities in the JT&E concept should be carefully scrutinized to determine how the desired results can best be obtained. All available test methods (studies, analyses, simulations, models, laboratory tests, mini-tests, and field tests) should be considered. Selecting the best test method for a test activity will be based on considerations such as the availability and credibility of the test method, expected acceptance of test results by the Services, fidelity of acquired data, availability of test site location, cost, and support.

When the appropriate test method has been identified and substantiated for each test activity, the methods should be incorporated into a test method matrix that identifies each test method

and rates its cost and risk factors relative to a specified test activity. The cost and risk factors will be based of the JFS evaluation of each method and should be portrayed in a manner that is consistent with the fidelity of the evaluation. In some cases, the matrix will have to be expressed in terms of low, medium, and high cost/risk. More comprehensive evaluations may provide the capability to express these evaluations in terms of numerical ratings; for example, a rating scale of 1-10. **Figure 3-6** is an example of a test method matrix. When the appropriate test methods have been identified, they will be incorporated into the test concept. The matrix will also be used in the consideration of programmatic and technical alternatives. A more detailed discussion of test methods can be found in Annex F.

TEST METHODS

Issues	Subissue	Studies		Simulation		Mini-test		Field Test	
		Cost	Risk	Cost	Risk	Cost	Risk	Cost	Risk
1.0	1.1								
	1.2								
	1.3								
2.0	2.1								
	2.2								
	2.3								
3.0	3.1								
	3.2								
	3.3								

Figure 3-6. Example of Test Method Matrix

Define Test Cell Composition

A full factorial evaluation during a JT&E is seldom feasible because of time and cost constraints. A test cell matrix should be developed to assure that the most significant combinations of controlled test variables are addressed in the JT&E concept. This matrix links the JT&E measures to specific test activities and test conditions that will produce the data required to resolve the program issues. The test cell matrix represents a balance between *test items*, *test environments*, *test conditions*, and *controlled test variables*. Potential uncontrolled variables should be identified so that provisions for documenting their occurrence can be incorporated into the JT&E concept.

Each test cell in the test cell matrix constitutes a stand-alone experiment of test items and procedures under specific conditions. **Figure 3-7** is an example of a test cell matrix.

The above components are the basis for the development of the JT&E concept. The JT&E concept should be reviewed by the TAB at the second JFS milestone to verify its technical credibility and to document its acceptance by the participating Services. This milestone review also allows for changes or revisions prior to the formalization of the APA.

Controlled Test Variables			Test Environments		
(Test Items)	(Tactics)	(Day/Night)	(Desert)	(Tropics)	(Arctic)
			A	B	C
1	1.1	1.1.1	1.1.1.A	1.1.1.B	1.1.1.C
		1.1.2	1.1.2.A	1.1.2.B	1.1.2.C
	1.2	1.2.1		1.2.1.B	1.2.1.C
		1.2.2	1.2.2.A	1.2.2.B	1.2.2.C
2	2.1	2.1.1	2.1.1.A	2.1.1.B	
		2.1.2	2.1.2.A	2.1.2.B	2.1.2.C
	2.2	2.2.1	2.2.1.A	2.2.1.B	2.2.1.C
		2.2.2	2.2.2.A	2.2.2.B	2.2.2.C



Not Required
 • Available Data
 • Not Logical
 • Etc.

Note: Each test cell is a test activity with defined test conditions

Figure 3-7. Example of a Test Cell Matrix

K. DEVELOP A JT&E DATA MANAGEMENT AND ANALYSIS METHODOLOGY

Planning for data management and analysis is not a distinct activity, but rather flows directly from the requirements interrelationships and between the test design, issue resolution approach, test methods, and measures. Depending on the type of test activities and events and the amount and type of data to be collected, data management may be simple and straightforward, or complex and resource intensive.

The JFS is responsible for laying out the approach and framework for these activities in sufficient detail so that it is possible to judge the impact of data management and analysis activities on the overall cost and scheduling of the program as part of the chartering decision. A good place to start is to look at how data management and analysis were carried out in other joint tests involving similar kinds of issues and data collection requirements. DESA is the repository for hardware and software used by previous JT&Es and should be able to provide the JFS with information relative to current capabilities and possible solutions to unique challenges in the data management and analysis area.

Data Collection

Data collection encompasses *what* will be collected, *how frequently*, and *by what means*. They all affect the feasibility and cost associated with the program test design. The JFS will have to determine which data collection efforts can be provided through existing range or facility instrumentation (e.g., TSPI, GPS, etc.) as opposed to those requiring specialized equipment that must be brought to the test location. Manual data collection methods (i.e., forms, logs, questionnaires, etc.) will have to be considered because most tests require at least some collection of this type of data. In some tests, manual collection forms may even be the primary source of data. Additionally, many different kinds of "record keeping" equipment (tape recorders, infrared, video and still cameras, meteorology stations, etc.) may be required as either primary or supplemental data sources. All of the above point to the importance of considering the entire data collection process in calculating the cost, equipment, and personnel needs of a proposed joint test. Some of the required data collection devices may be "long-lead" items that will necessitate immediate action by a JTF upon charter.

Data Management

Data management encompasses all of the control processes and hardware and software involved in collecting, storing, and retrieving test data. Although it is conceivable that a test may involve only a manual data management system, it is much more likely that the data management system will be computerized. Thus, computer hardware and software requirements must be addressed early on. Hardware choices will be

driven by such factors as data storage requirements, security, turnaround time, number of users, and networking requirements. Software needs can generally be met with commercial off-the-shelf relational database systems, although some development of specialized preprocessing software may be required. Increasingly, multimedia databases that can store video, audio, and image files are becoming available at reasonable cost. This equipment makes the integration of different types of test data possible and can greatly add to the tools available for analysis and reporting.

Many factors such as processing time and user expertise, determine how much development will go into automating and customizing such functions as data entry, error checking, database querying, and report generation. DESA and the Service test resource managers can provide valuable information and guidance to the JFS based on experience with many kinds of tests and a wide range of hardware and software tools.

Data Analysis

Data analysis software needs, in many cases, can be met by the database itself or with the analysis functions available in easy-to-use spreadsheet software. If statistical analysis is required, it will usually be advisable to have a statistical software package available. Graphics capabilities, tables, and flowcharting requirements must also be addressed and a determination made as to whether specialized software must be purchased, or whether database or analysis software can be adapted to satisfy these needs. In addition, consideration should be given to analysis requirements for the various other media that may be required. For example, if

audio and video data are expected to be extensive or serve as the primary data source, a tool such as a digital audio processing system should be considered.

Figure 3-8 is an example of a flow process that has been used by previous JT&Es to develop data management and analysis methodologies. Whatever the decision, the selected analysis methodology should address all aspects of issue resolution to include considerations of how the data will be used to provide results, conclusions, and recommendations. The methodology must also consider the possible requirements to access various formatted data sources; respond to changes in instrumentation sources, formats, and

contents; track entire data sets and documentation; and extract patterns of system behavior from large data sets.

Analysis Planning

Planning for the analysis of the collected data is an iterative process that involves both formal and informal analysis of the employed concept and system capabilities (threat, environment, tactics, interoperability, etc.) in terms of the mission that it supports. Techniques that have proven effective in the development of analysis plans include process analysis, engineering analysis, matrix analysis, systems analysis, and structured analysis.

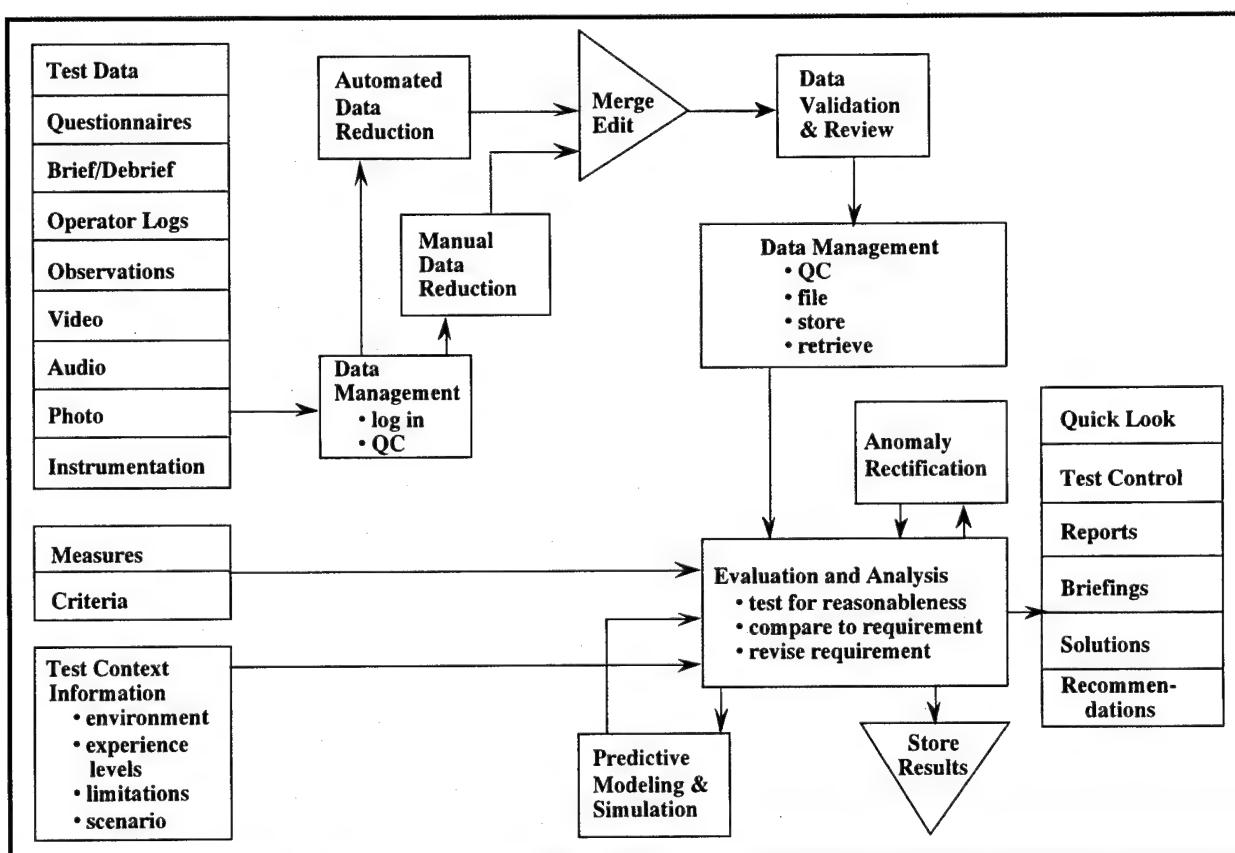


Figure 3-8. Example of a Data Management and Analysis Flow Process

Process analysis consists of thinking through how the concept or system will be used in the projected environments (threats, missions, and scenarios) in order to understand and evaluate the actions, events, situations, and results that are expected to occur. It involves decomposing the objectives to be achieved into the processes or actions that must be accomplished. These processes are then translated into system characteristics or attributes that can be measured by the test activities. This technique is most often used when the JT&E involves methodologies and concepts. Process analysis measures are frequently based on concept or system attributes.

Engineering analysis consists of evaluating the mechanical or functional operations of a system. This technique involves a systematic exploration of the system hardware and software components, purpose, performance bounds, manpower and personnel considerations, known problem areas, and impacts on other system components. Exploration of the way the system operates as compared to intended performance is used to identify issues, measures, specific data elements, test activities, and required instrumentation. Measures to support this type of analysis are usually based on system or component specifications, or expected/projected performance.

Systems analysis consists of determining the interdependencies and interactions between system components. This technique is used to define the relationships between system characteristics to optimize the design within an overall system concept.

Structured analysis consists of decomposing the issues to the point that test activities required to obtain the data elements can be identified. This is the most commonly used of the analysis techniques. Annex E provides a detailed explanation of the structured analysis approach and process.

Matrix analysis is useful to diagram the interactions or interdependencies of the measures and serves as an organizing concept to characterize problems. This technique can be useful for tracing a system's operational requirements through issues, criteria, sources of individual data requirements, and test activities. Measures to support this type of analysis generally consist of parametric evaluations of multiple system or component functions.

L. DEVELOP THE JT&E SCHEDULE

The joint test concept will identify the required test activities and events that must be accomplished within the three years allotted for a JT&E. The JFS must incorporate these test activities into a program schedule that provides for completion of the test activities in sufficient time to accommodate analysis and reporting requirements. The test method matrix identified the best test methods for accomplishing each of the test activities. The JFS must determine where and when these test activities can best be accomplished. Interfacing with OSD, Joint Staff, and the Services is required to identify training exercises, command post exercises, and other test events that might be used to satisfy the joint test requirements. **Figure 3-9** is an

Test Opportunities	FY X				FY Y				FY Z			
	1	2	3	4	1	2	3	4	1	2	3	4
Development Activities												
Services												
DISA												
Technology Demonstrations												
Services												
ARPA												
Scheduled Exercises												
USPACOM-Brave Tempo												
USLANTCOM-Ocean Venture												
ACC-Green Flag												

■ Demonstration ■ Simulation ■ Training Exercise □ CPX

Figure 3-9. Example of a Test Opportunity Schedule

example of a test opportunity matrix that identifies scheduled Joint Staff and Service activities that might be used to satisfy JT&E requirements.

Interfacing with the controlling agencies of the scheduled events will determine if and when participation is possible. If there is no possibility of using already scheduled events, the JFS will have to consider conducting dedicated test activities. When agreement has been reached that the JT&E can participate in the required events, the JFS should consolidate the potential events and the planned joint test activities into a JT&E test schedule. **Figure 3-10** is an example of a generic test schedule that provides an overview of the potential for accomplishing the planned test activities.

M. DETERMINE IF THE PROPOSED JT&E IS FEASIBLE

Determining whether the JT&E is feasible is more complex than determining whether the JT&E is necessary. Five questions must be answered, each bearing on the determination of feasibility:

- Are the resources (personnel, ranges, test items, etc.) available?
- Can the JT&E be completed in three years?
- Are the benefits gained worth the cost?
- Can a solution be found and do the technologies exist to support the solution?
- Is joint testing the most effective way to resolve the concepts or issues?

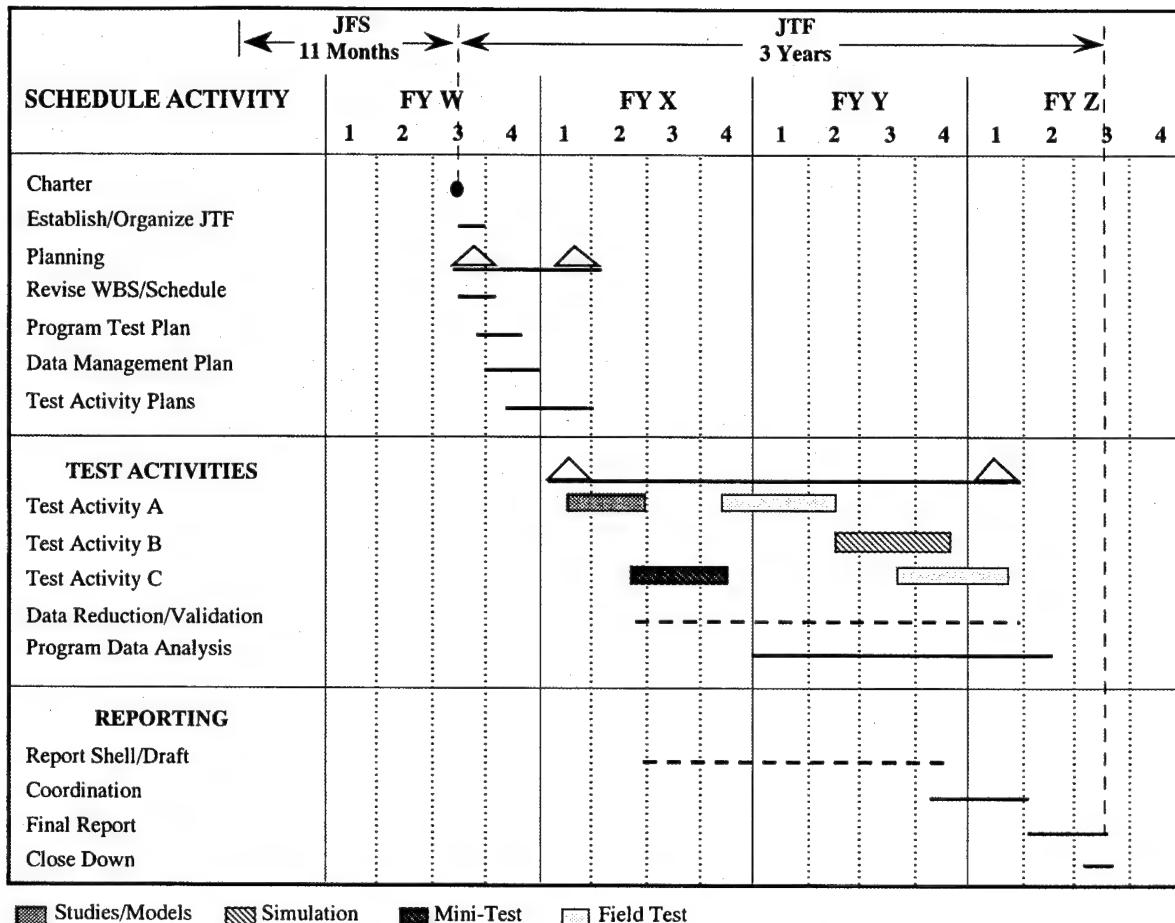


Figure 3-10. Example of a JT&E Program Schedule

The FSD must plan and manage the JFS activities so as to obtain the required information and data to answer these questions. The source and accuracy of the information and data will determine the credibility of the answers and recommendations that will be developed. The FSD must, therefore, decide early in the JFS what and how much information is required to assess the questions that support the determination of *is the JT&E feasible?*

Are the resources available? The procedures to quantify the required resources to accomplish the proposed JT&Es mission are discussed in Chapter 4. Once quantified, direct

coordination with the respective resource providers should generate sufficient information to answer the question.

Can the joint test and evaluation be completed in three years? The test concept and approaches for achieving the JT&E objectives identified the test activities that are required to resolve the issues. Many of these activities will be conducted in conjunction with already scheduled Joint Staff or Service exercises or events, some of which may be conducted in OSD or Service facilities. Coordination with the organizations that control these exercises, events, ranges, or facilities will provide the information

required to determine if JT&E participation is possible. This information will be incorporated into the T&E schedule that will, in turn, provide information to answer the question.

It may not be possible to complete a JT&E in the three-year time frame; it is incumbent upon the FSD to plan an achievable JT&E. If the JT&E cannot be achieved in three years, the FSD must own up to that fact and fully justify the required time frame. The FSD should not base the JT&E on the expectation that additional time and funds will be made available once the JT&E is chartered.

Are the benefits gained worth the cost? The question of benefits gained versus cost will be more difficult to answer. The benefits gained will be based on an untested concept or proposed solution to an issue or problem, and the overall cost estimates will be based on the best estimates of the support required to participate in future events. In other words, the data available to answer this question will be subjective, and the credibility of this data may be challenged. The data gathered to answer this question should, therefore, be validated in terms of data source and general acceptance by the T&E community. The key to answering this question lies in the source of the data and the credibility of the source.

Can a solution be found and do technologies exist to support the solution? The joint test concept is a proposed solution to the nominated concepts or issues. The development of the test method matrix involved examination of available test methods in terms of their credibility, the ability of producing the requisite data and its fidelity, and the general

acceptance of the test results. The JFS must develop sufficient information to judge the probabilities that the technologies exist to support the proposed solution. If a proposed solution cannot be found or an acceptable test method (technology) is not available, the FSD should immediately advise the DDT&E of the situation to discuss alternative solutions.

Is joint testing the best vehicle for resolving the nominated concepts or issues? Answering this final question will be based primarily on subjective inputs. The JFS team should solicit inputs from experts on the subject at the highest level possible. If the nomination involves two or more Services, there are two vehicles for resolving the nomination: a multi-Service operational test and evaluation (MOT&E) or a JT&E. If it does not involve policy, doctrine, or Service parochialism, a MOT&E is probably the best test vehicle. If policy, doctrine, new concepts, or Service parochialism are involved or even suspected, then a JT&E is probably the best vehicle. Other considerations in answering this question could include the time required to develop, test, and implement a solution; the magnitude of the concepts, issues, and objectives; and cost.

Environmental Considerations

As the specific test activities are defined in the JT&E concept, the JFS must include consideration of environmental factors and their potential impact on the feasibility question. Government regulations mandate that DoD activities comply with all legal statutes, such as the National Environment Policy Act (NEPA), to ensure the preservation of natural resources. There may be issues associated with a proposed

JT&E that require mitigating actions or schedule changes to avoid an adverse environmental impact. Because such actions may involve lengthy procedures, such as Environment Assessments (EA) or Environmental Impact Statements (EIS), the JFS should anticipate and avoid environmental issues whenever possible. For assistance on environmental issues, the FSD should contact the lead Service JT&E POC. Annex K contains a more detailed discussion of environmental compliance requirements.

Security Considerations

The JFS must also consider security requirements and how they could affect feasibility. Risk assessments regarding the system under test may be required. Operations security (OPSEC) for all phases of the JT&E could be a major determinant as to the location and timing of test events. Additionally, the JFS timelines must consider the time that may be required to acquire equipment for processing classified information as well as personnel clearances and upgrades. The requirement for a SCIF and SCI billets can significantly impact the funds and time needed to conduct a JT&E.

Other Considerations

There are a number of other variables over which the FSD has little or no control, but which could influence feasibility. One is the level of JT&E program funding. While a JT&E may be feasible and project significant payoffs, there may be insufficient funding available for charter. Another variable involves political interest and sensitivities. Congressional interest, both favorable and unfavorable, can have significant influence over which JT&Es are chartered. Other

variables could include the availability and priority for use of test assets and resources (equipment, instrumentation, facilities, ranges, manpower, and technology) that are required for the proposed JT&E and Service support (willingness to provide funding, personnel, and equipment) for the JT&E. The FSD must remain sensitive to these variables and consider each in making conclusions and recommendations regarding the feasibility of the nominated JT&E.

PART TWO

ANALYSIS PLAN FOR ASSESSMENT

The Analysis Plan for Assessment (APA) is a continuation of the sequential test concept process that defines and formalizes what actions and resources are required to accomplish the JT&E. In the previous part of this chapter, the JFS addressed whether a JT&E is necessary and feasible. If a JT&E is justified, the JFS should develop a APA to formalize *what* will be required to accomplish the JT&E, *who* is responsible for the required tasks, *when* and *where* the test activities will be conducted, and *what* resources will be required. The specifics of *how* each test task and activity will be conducted is covered in a test plan for that specific test activity, which will be developed by a JTF when chartered. The APA is a formal stand-alone document that is presented with the JFS final report.

N. REFINE AND INCORPORATE THE JT&E CONCEPT INTO THE APA

The JFS team should be continually refining and expanding the level of detail in the approved JT&E concept and quantifying the OSD

and Service resources required to execute the proposed JT&E. When the FSD is satisfied that the details in the concept are sufficient, the JFS team will formalize the JT&E concept in the form of the APA.

JT&E nominations involve concepts and issues that vary in technical complexity and test activities ranging from isolated studies to large scale field tests involving multiple test methods, locations, ranges, force sizes, operational missions, and Service involvements. It is not likely that any APA structure will be applicable to all proposed JT&Es. A suggested APA outline is included as Part One of Annex N. The suggested outline is provided as a guide for those who have not previously developed a test design and is not intended to restrict creativity. The APA, when formalized, becomes the program roadmap for the execution of the JT&E by a JTF.

The APA outlines *what* must be done to complete the proposed JT&E within a three-year time frame. It also identifies where the test activities will be conducted, the relationships between test events, the resources that will be required to accomplish the JT&E, and who is responsible for providing the resources. The APA will be coordinated through the appropriate OSD, Joint Staff, and Service organizations. In that the TAB reviewed and concurred with the program test concept, the final TAB review of the APA will be conducted in conjunction with the JFS final report review at the third JFS milestone. The DDT&E will be the approving authority for the APA.

O. CONSIDER ALTERNATIVES

The JFS should consider alternatives to the full scale test concept that was previously developed under few or no constraints (primarily need, feasibility, and time). As the T&E concept definition matures, the FSD may find that resource requirements increase. Increases in resource requirements and countervailing DoD budget limitations could result in a feasible JT&E not being chartered. The FSD should, therefore, consider alternatives for conducting the JT&E that are based on reduced funding levels, and that would nonetheless provide meaningful results. If the program is technically feasible, there may be alternatives that could resolve the issues, or at least the critical issues. The FSD should anticipate and identify an expected level of funding and develop a baseline program below which few or no benefits would occur. The FSD then could consider alternatives that are reduced but above this baseline. Alternatives should be based on consideration of reduced resource requirements made possible by changing test conditions (e.g., field exercise vice lab test), using a more bare-bones tactical scenario, increased use of historical data, and so on. Two basic techniques that have been used by previous feasibility studies for the downward rescoping of JT&E test concepts are programmatic restructuring and technical restructuring.

Programmatic restructuring involves tradeoffs between resources, time, funds, and the benefits to be gained from the JT&E results. A reduced program might be able to resolve

the JT&E issues for only a limited set of circumstances. These circumstances, however, might be those that are most critical or those that occur most frequently. Programmatic restructuring might also be achieved by dissecting the joint test issues and addressing only those considered most significant. Further restructuring could consider reducing the number of controlled test variables (environments, systems, tasks) in the test cell matrix.

Technical restructuring involves tradeoffs between the cost and risk associated with each of the planned test activities. For example, the results from dedicated field tests are credible, but are the most expensive form of testing. On the other hand, simulations can be less expensive, but have been less credible to the T&E community. Most JT&Es will involve a mix of several test methods to achieve the planned test activities. Restructuring the test method matrix (see **Figure 3-6**) could produce reduced resource requirements and, in turn, reduced funding requirements.

PART THREE **REVIEWS, BRIEFINGS, & REPORTS**

P. PROGRESS REVIEWS

The primary recipient of JFS progress reviews will be the DDT&E. ***The FSD should establish a schedule to provide quarterly update briefings.*** These briefings will review the general and financial status of the JFS and present topics of current interest to the DDT&E, such as critical milestones, issues, status of document preparation, and results of coordination. As needed, a detailed financial profile, including commitments, expenditure,

remaining balance, and spending plans, should be provided. It is very important to keep the Services informed and to address their concerns through proactive, routine IPRs. Other agencies may be included in periodic but less frequent reviews.

In preparing for these reviews, the FSD should develop modular briefings using a standard format. Use of modular templates on a LAN will facilitate the development and upgrade of these briefings. Contributors to the briefings should update the data in their respective sections at specific times each month. The briefings can also be used for internal status reviews, popup responses to information or data queries and updates to other agencies as the need arises. The primary thrust of these briefings, however, is to support the DDT&E quarterly reviews, and inputs to the briefings should be timed and formatted to be compatible with that requirement. The basic elements in the reviews include JFS progress, budget, and problems/solutions.

JFS Progress

This area of the review includes JFS milestone completion, projections, slippage, problems, challenges, and risks. Items of particular importance are completed and projected activities, decision points, and interfaces with other agencies. The identification of long-lead preparations and projected procurement requirements should also be noted.

Budget

A graphic depiction of the status of JFS monies should be presented that displays funds committed, obligated, and expended and the

remaining balance. The planned versus actual cost and the cost of future JFS activities should be presented when significant. Direct cite monies, reimbursable and Service funds, and contracts should be addressed.

Problems and Solutions

This area of the review should remain flexible because it is situational-dependent. Nevertheless, it is important to keep the DDT&E informed of problem areas encountered, solutions worked, those remaining unresolved, assistance needed, and the potential impact of the problems on the JFS or proposed JT&E. Applicable areas in which DDT&E awareness is necessary include coordination of JFS and projected JT&E requirements within OSD, the releasability of classified information, resource priorities, and OSD/Service coordination relative to participation in exercises, tests, or the support of dedicated JT&E activities. DDT&E **must approve any press statements or releases.**

Q. JOINT FEASIBILITY STUDY STATUS REPORTS

In addition to the progress reviews, the FSD will provide a monthly status/activity report to the DDT&E. These reports are not intended to duplicate the information in the progress reviews, but rather keep OSD informed about how the JFS is faring, what the problems are, where OSD and Service help is needed, and what are the JFS recommended courses of action. The FSD should ask himself/herself what would he/she want to know to help manage the feasibility study and report that information. Because of the environment in which we work, the report must also address the current financial status. Funds

should be delineated by source and year, amount received, committed, obligated, expended and the remaining available balance. The reports should not be extremely detailed nor time consuming for either the writer or the reader. Items to be considered for inclusion are:

- Number of personnel assigned.
- Comment on adequacy of support and OSD assistance needed.
- Significant visits to the JFS during the reporting period and projected visits during the upcoming period.
- Schedule of upcoming activities.
- Highlighted issues related to Service coordination, resources, etc.
- Accomplishments.
- Problems.

R. JFS FINAL REPORT

The JFS final report is the most important document that the JSD will produce. It is the documentation upon which the D,T,SE&E will base his or her decision relative to chartering of the JT&E program. It is incumbent on the FSD to devote the required time and resources to assure that the final report and its accompanying briefings are quality products and that they contain meaningful results, conclusions, and recommendations. Further, these reports and briefings must be supported by precise and reasonable documentation.

The APA is an integral part of the JFS final report, and both should be fully coordinated with OSD, Joint Staff, and the Services before presentation to the TAB for review. The JFS final report should discuss the necessity and feasibility of the proposed nomination, its scope, concept, methodologies, limitations, risks, and resource requirements. If the JFS recommends the chartering of a JT&E the JFS final report

should also include a recommendation for the location and staffing of the JTF. The recommendation for JTF location should be based on considerations of available facilities, travel requirements relative to projected test activities, and the availability of qualified personnel to support JT&E planning and execution requirements. A recommended format for the JFS final report is included in Annex N.

S. JFS MANAGEMENT REPORT

The JFS management report serves three purposes. First, it provides the DDT&E with the FSD's assessment of the JFS, to include accomplishment of the directed mission. Second, it documents lessons learned for consideration in the organization and management of future JFSs. *Documenting lessons learned has historically been one of the poorly supported parts of the JFS process.*

Admitting a lesson learned is frequently interpreted as admitting a mistake. Lessons learned seldom benefit the author and, thus, frequently receive a minimal level of effort. However, lessons learned can be of significant value to the effectiveness of future JFSs. In the preparation of the lessons learned and recommended actions, the FSD should separate those that are systemic from those that are new or unique so as to add emphasis to both types. Third, the report provides recommendations for actions to improve the efficiency and effectiveness of future JFSs. Feedback on problems and solutions tried (successful or not) from previous JFSs should be included.

If the JFS is not chosen to continue as a JT&E, a management report should be completed within 30 days following the non-chartering decision. A suggested format for the JFS management report is included as Annex N.

CHAPTER 4

RESOURCE REQUIREMENTS

A. INTRODUCTION

The JFS must address resource requirements at two levels: 1) to support its own daily operation and execution of its chartered mission and 2) to project JT&E resource requirements for the JTF chartering decision. Resource requirements in support of the JFS are discussed in detail in Section C of Chapter 2.

Decisions relative to the chartering of a JTF will be based on information and data collected during the JFS, and the resulting recommendations will be briefed during the coordination process and published in the JFS final report. A major factor contributing to the *"is it feasible?"* question and, thus, the chartering decision, is the availability of resources to accomplish the activities as outlined in the proposed APA. The JFS team, in conjunction with the supporting Services, will develop a Consolidated Resource Estimate (CRE) that identifies the funding, personnel, and equipment required to execute the proposed JT&E. In the past, the reliability of the data in the CRE has had a direct bearing on the credibility of the JFS recommendations.

B. CONSOLIDATED RESOURCE ESTIMATE

Request for Service Resources

Most, if not all, of the personnel, equipment, and facilities required to support the

testing efforts of the JT&E, as well as the support of the JTF cadre, will be provided by the Services. Thus, the Services must include these requirements in their resource management planning documents and budget requests in order to ensure that they will be available to meet the JTF needs. The JFS, in coordination with the lead and supporting Services, will develop an estimate of the resources (personnel, equipment, and funds) required along with an expected time frame and suggested source to fill the needs. These estimates will be consolidated into a single document, the CRE. An outline for the CRE is in Annex I.

The Army and Air Force have organizations that support and monitor their Service's involvement in JTFs and have established formal processes to review, manage, and provide resources for JT&E support. On the other hand, the Navy and Marines assign staff responsibility for JT&E support on a case-by-case basis along operational staff functional lines of interest. When support for a particular JT&E is approved, a Navy or Marine staff sponsor is assigned to coordinate and provide the required resources. No matter what form the Service JT&E support agencies take, it should be noted that the processes for recognizing, coordinating, and providing the required resource support can take in excess of a year. A JT&E reality is that Service resources may not be available for the first 18 months of a 36-month test and evaluation. *It is imperative that JT&E resource requirements be identified and*

submitted to the Services in the proper formats as soon as possible after the JTF is chartered.

If it is apparent that the JFS recommendation will be to charter a JT&E and that decision is fully supported by the Services, the JFS Service deputies should break out their portion of the CRE in the format of their particular Service and have these breakouts available for JTF action upon chartering. The JFS Service deputies should coordinate these resource requirements with their respective Services so they can anticipate the requirements in order to compress the lead times for acquisition of the resources. This will provide for the earliest possible establishment of JT&E resource requirements in Service channels.

United States Army

The Operational Test and Evaluation Command (OPTEC), in coordination with the Deputy Chief of Staff for Operations (DCSOPS), is the overall Army manager and resource provider for JT&E support. OPTEC has established an interdepartmental Army committee, the Test Schedule and Review Committee (TSARC), that provides centralized management of Army resources to support test activities. The formal document for submitting requests for Army resources to the TSARC is the Outline Test Plan (OTP). New or revised OTPs are forwarded to OPTEC for review and coordination prior to presentation to the TSARC for their consideration.

TSARC meets bi-annually to review and approve or disapprove requests for utilization of Army assets in support of test activities. The

purpose of the TSARC is to maximize the use of limited resources and minimize the impact of these activities on operational units and their readiness. OPTEC publishes the *TSARC Handbook* that contains the guidelines and procedures for requesting Army resources. Copies of the *TSARC Handbook* can be obtained through OPTEC CSTE-OPM, telephone (703) 756-1516. TSARC responsibilities include:

- Reviewing and recommending coordinated OTPs for inclusion in the Five Year Test Plan (FYTP).
- Ensuring adherence to the one-year notification requirement for resource commitments or enforcing compliance with the exception policy.
- Reviewing and recommending approval of T&E priorities.
- Reviewing and coordinating resources to support T&Es.
- Resolving conflicts between user test requirements and other missions.

OTPs are submitted in March and September of each year using the format contained in Appendix A to the *TSARC Handbook*. They should contain requisite information on support requirements available at the time of submission. Once submitted, OTPs are updated through the TSARC process in March and September of each year as revised OTPs. *OTPs are to be submitted for TSARC consideration at least one year before the first resource is required to allow resource planning against approved OTPs.* If the Army resources are to be provided by the Major Command (MACOM) or Field Operating Agency (FOA) responsible for the OTP, the OTP may be submitted one TSARC

cycle (i.e., six months) before the scheduled test date. This will ensure that the required resources are entered into the FYTP for at least one TSARC cycle in order to provide for the monitoring of test resources and test status. OTPs that do not provide at least one year between TSARC approval and first resource commitment will be processed as an exception to policy. Exception-to-policy OTPs will be forwarded to the TSARC under a cover letter signed by a general officer of a TSARC member headquarters, stating justification for the requested policy exception.

United States Air Force

Air Force Instruction 99-106, *Joint Test and Evaluation*, 18 March 94, provides guidelines and procedures for Air Force participation or support of JT&E programs directed by OSD. It describes the responsibilities, planning, and execution for JT&E participants. HQ USAF/TE sets Air Force policy for JT&Es and is the office of primary responsibility (OPR) for Air Force participation in the JT&E program. The Air Force Operational Test and Evaluation Center (AFOTEC) assists HQ USAF/TE in the execution of the JT&E program and is designated as the Air Force manager for chartered JT&Es. All requests for JT&E dedicated manpower support are forwarded to AFOTEC for processing and HQ USAF/TE validation. AFOTEC/XRJ is the AFOTEC JT&E action office and receives specific JT&E support requests. The formal document for requesting resources from the Air Force to support joint tests is the Test Resource Plan (TRP). Air Force MAJCOMs and FOAs will provide most, if not all, of the required resources. The guidelines and procedures for requesting Air Force resources for

a JT&E are contained in *AFOTECI 99-101 and AFOTEC Pamphlet 55-8*. Copies of this instruction and pamphlet can be obtained by contacting AFOTEC/XRJ, telephone (505) 846-5339.

AFOTEC/XRJ is responsible for:

- Assisting in the preparation of TRPs.
- Monitoring Air Force support of JT&Es through the TRP process.

MAJCOMS and FOAs provide most of the resources and personnel to support JT&Es. Each MAJCOM and FOA will maintain a permanent POC for JT&E matters. Information relative to these POCs can be obtained from AFOTEC/XRJ. MAJCOMs and FOAs are responsible for:

- Supporting AFOTEC in interfacing with the JT&E directors.
- Providing personnel and equipment as tasked in Air Force test directives.
- Programming resources against approved TRPs.
- Evaluating JT&E impacts on operational capabilities.

The TRP is the vehicle for integrating JT&E resource requirements into the Air Force resource planning, programming, budgeting, and execution system. The guidelines and procedures for preparing and submitting the TRP are contained in *AFOTEC Pamphlet 55-8*. New TRPs will be coordinated with the appropriate commands and agencies and forwarded to AFOTEC/RM to coincide with the two established TRP cycles, October through December and April through June. Out-of-cycle

TRPs may be submitted if major program restructuring or other substantial changes occur. TRPs will be kept current to reflect maturing JT&E resource requirements. TRPs should be revised as soon as program or test schedules change and should always reflect the most current status of resource requirements.

United States Navy

The principal POC for JT&Es is located in the Office of the Director of Test and Evaluation and Technology Requirements (N091), specifically in the T&E Division (N912D2). The JT&E POC who provides liaison and interface with OSD on JT&E policy and resources issues is N912D2. In contrast to the Air Force and Army, the Navy selects and delegates authority and responsibility for JT&Es on a case-by-case basis.

For Navy support of a specific JT&E, N091 will be responsible to staff the selection of an appropriate sponsor from the Chief Naval Operations (CNO) staff organization and will assign a Test and Evaluation Identification Number (TEIN) and a CNO priority. The CNO staff sponsor is responsible for staffing the selection of a field-level Navy agency to support the JT&E. The responsibilities and staff actions within the CNO staff for JT&Es are shared between N912D2 and the technical sponsor. This procedure provides a team approach in which the JT&E POC is knowledgeable concerning the entire spectrum of JT&E activity. The CNO sponsor provides specific functional expertise, and the field-level sponsor supports the JFS or JT&E.

There are no specific Navy directives relative to obtaining resources to support a joint test. Resource requirements must be requested and arranged for on a case-by-case basis through the CNO and field level sponsors.

N091 is responsible for obtaining and assigning the TEIN and the CNO priority and for staffing the selection of the CNO staff sponsor.

The CNO staff sponsor is responsible for staffing the selection of the field-level sponsor and for providing the field-level structure for supporting JT&Es.

The field-level sponsor is responsible for staffing and providing resource requirements for the JT&E, to include request for manpower billets and the requisition of personnel.

The Operational Test and Evaluation Force (OPTEVFOR) is the independent operational test agency for the Navy and is responsible for the operational test and evaluation of weapons systems, ships, aircraft, equipment, procedures, and tactics, when required. OPTEVFOR is a valuable source of testing expertise and assistance to the JT&E.

United States Marine Corps

Within the Headquarters Marine Corps (HQMC) staff, the responsibilities for JT&E support are shared between several deputies. The Deputy Chief of Staff for Requirements and Programs (DC/S R&P) is responsible to coordinate Program Objective Memoranda (POM) activities. The Deputy Chief of Staff for Manpower and Reserve Affairs (DC/S M&RA),

after consultation with Marine Corps System Command (MCSYSCOM) and the Director Marine Corps Operational Test and Evaluation Agency (MCOTEA), is responsible for the validation of manpower and personnel requirements and the identification of Service representatives for approved JFSs and JTFs. The Fiscal Director of the Marine Corps (FDMC) is responsible to coordinate with the DC/S R&P to ensure that budgetary and programmatic decisions support the JT&E, the Marine Corps mission, and the budget.

MCO 5000.11B is the Marine Corps Order (MCO) governing test and evaluation, to include participation in and support of JT&Es. This MCO is being staffed for revision. The FSD can obtain a current version by contacting the MCSYSCOM JT&E POC at telephone (703) 640-5963.

Requests for Marine Corps resources to support a JT&E are staffed on a case-by-case basis. The principal POC for a specific JT&E is MCSYSCOM, specifically the Test and Evaluation Division (MCSYSCOM/T&E). MCSYSCOM/T&E will coordinate requests for resources with the appropriate HQMC staff and MCOTEA. The HQMC staff will coordinate those actions necessary to provide the approved resource support. MCOTEA will recommend to the Commandant of the Marine Corps (CMC) the selection of a Fleet Marine Force (FMF) to support the joint testing. The FMF will designate FMF coordinators at applicable units and provide the approved resources and support.

MCSYSCOM/T&E is the principal POC for all JT&E support requirements, to include

technical assistance, personnel, equipment, and forces.

DC/S R&P, after consultation with MCSYSCOM and the Director MCOTEA, is responsible for the validation of manpower and personnel requirements and the identification of Service representatives for approved JT&E positions.

MCOTEA is the Marine Corps independent T&E organization responsible for adequate testing, objective evaluation, and independent reporting in support of the Marine Corps acquisition process. MCOTEA is also responsible to recommend to CMC the selection of the FMF to support joint testing; to provide technical support to the Marine Corps joint technical director in the form of assistance in test planning, direction, and reporting; to ensure the quality control of Marine Corps participation; and to conduct independent evaluations as may be required.

The Fleet Marine Forces are responsible to designate FMF test coordinators in the FMF headquarters and at each division or wing and to provide the approved resources required to conduct or support the JT&E.

C. COST ESTIMATES

Cost estimates of the resources in the CRE can be developed by quantifying each in terms of *what* will be required, *where* it will be required, *when* it will be required, how *long* it will be required and *how* it will be provided at the required location. This can be accomplished by decomposing the CRE into specific items, costing each, and then aggregating the cost by

time and responsibility. The CRE decomposition should be tailored to the unique requirements of the JT&E. The following are suggested topics that might be considered in a breakdown of the resource requirements in the CRE.

- **Category** (personnel, facility requirements, transportation, materials, support equipment, aircraft sorties, etc.).
- **Type** (rank, technical qualifications, type of aircraft, secure space, etc.).
- **Location** (home, deployed, labs, ranges, etc.).
- **Duration**.
- **Relocation and transportation requirements.**

While it is realized that each proposed JT&E is unique and may require unique data collection and analysis equipment, there are many items and requirements that are similar and constant between JT&Es. Annex J contains a generic test program cost/budget matrix that can be used to identify and cost potential JTF requirements. Because each proposed JTF will have unique requirements, the matrix will have to be adjusted and tailored by the JFS team to meet the needs of the proposed JT&E.

The cost for usage of range and laboratory facilities should be obtained directly from the facility operators. The cost associated with Service-provided resources could be obtained by the JFS deputies through interface with their Services' operational commands and logistical agencies. The cost to satisfy unique JT&E hardware, software, and instrumentation interfaces or modifications should be obtained from the most reliable source available to the JFS (OTAs, labs, ranges, vendors, etc.). DESA is a

valuable source for cost information, as well as the actual provisioning of instrumentation, data collections, and analysis equipment. DESA has both a considerable inventory of free issue testing equipment and cost data from previous JFSs and JT&Es.

The costs of the individual items are then aggregated by location, time, and responsibility (OSD or the Services) and incorporated into an overall cost estimate for the JT&E. If the estimated cost exceeds the fiscal guidelines outlined for the JT&E by DDT&E, the JFS should consider programmatic or technical restructuring of the JT&E to reduce the estimated cost. While it is recognized that the actual responsibility for test item cost may be negotiated by the OSD and Service agreement (Charter) establishing the JT&E program, there are general guidelines for determining cost responsibility for the CRE items.

OSD provides partial funding to JT&Es in accordance with *DoD Manual 7110-1*. These OSD funds (PE 0605804D) are used to pay costs incurred for the direction, supervision, and performance of the JT&E and those that are unique to JT&E needs, such as development of the test design and supporting test plans; procurement, installation and operation of unique instrumentation; transportation, travel, and per diem cost for the JTF staff; modification of test articles to obtain test data; data collection, reduction and analysis; and test reporting. Thus, costs that are incurred solely as a result of conducting a JT&E and that cannot be regarded as providing long-term military mission-oriented benefits are normally funded by OSD.

The Services are responsible for normal operational and maintenance (O&M) expenditures in support of the JT&E, such as civilian pay, travel (for other than the JTF staff), utilities and rents, Service-owned equipment maintenance, supplies, printing, reproduction, and communications. The Services also provide the support budgets and funds for normal training missions, OPTEMPO, non-industrial funded aircraft operations, and TDY costs for Service exercise participants and personnel other than the JT&E staff who are involved in test activities to collect data.

In general, OSD funds test unique costs, while the Services fund administrative, civilian salary, and select other expenses. **Figure 4-1** summarizes normal funding responsibilities.

D. OTHER RESOURCE-RELATED JTF REQUIREMENTS

Once the JT&E resource requirements have been identified and quantified, the JFS should consider and provide recommendations to the SAC and the D,T,SE&E on manning and JTF location. The JFS should also provide the newly appointed Joint Test Director (JTD) with recommendations relative to staffing and equipment acquisition actions that should be initiated immediately after the JTF is chartered.

Location

In general, the recommended location will be at a military installation. Location recommendation should include:

- Availability of JTF office/work area facilities.

- Proximity of Service support agencies and equipment.
- Proximity of required test facilities (such as labs and ranges).
- Travel requirements.
- Access to communications.
- Access to special security facilities (if required).
- Transition of JFS personnel and assets to the JTF.
- Availability of qualified support personnel.
- Operating costs.
- Availability of housing and personnel support facilities.
- Quality of life considerations.

Facilities

It is unlikely that the facilities used by the JFS would be adequate to house the JTF when fully staffed. The JFS facility, however, should be adequate to house the initial JTF cadre and, thus, provide the JTD time to negotiate for additional space. The FSD should discuss JTF facility requirements with the host installation and should include the availability of facilities to fully support JTF requirements in his JTF location recommendation. Facility considerations should be based on 150-200 square feet of office space for each JTF member with an additional 500-1000 square feet for a briefing area. All of the space should be available at a single location. Facility considerations should also include the requirement for related computer/ADP support and for the storage and handling of classified documents.

Figure 4-1. Responsibilities for Providing JT&E Resources

Staffing

Estimated manning requirements will be a major factor in the JTF chartering decision. The size of a JTF will be based on the mission and tasks to be accomplished. JTF manning will primarily involve PCS personnel that are provided through the Service personnel systems. The Service personnel systems can take up to 10-14 months to provide PCS personnel; thus, the JTF could operate for roughly half of its 36-month duration before full staffing is achieved. It is, therefore, incumbent on the FSD to estimate JTF manning requirements as accurately as possible and coordinate these requirements with the Services so that no time is lost in establishing personnel requirements once the JTF is chartered.

When the SAC recommends approval of the JTF charter, each Service member of the SAC commits his Service to provide the appropriate resources to complete the JT&E. Additionally, the D,T,SE&E commits OSD to provide appropriate resources to complete the JT&E. In turning to the Services for the required personnel, the FSD and, in turn, the JTD must recognize that the Services' ability to support the requirement will be largely dependent on timing and normal rotation cycles. Coordination by the FSD with the Service personnel support POCs

and personnel management centers during the conduct of the JFS can alleviate some of these problems. This early coordination enables the Service personnel centers to plan and prepare for the potential requirements of the chartered JTF. This preparation would include the identification of personnel who would be immediately available and perhaps the alerting of personnel to the potential assignment so that they are prepared to relocate on short notice.

The JFS must take a hard look at the Service skills and experience required for conduct of the JT&E. Experience in past JTFs would indicate that the FSD should recommend that all personnel be assigned full-time on a PCS basis and that all should be stationed at the JTF facility. The JFS must recognize that, even with early coordination with the Service personnel centers, acquiring military personnel on permanent assignment to the JTF may involve a period of several months before the person actually arrives for duty. In such cases, and particularly if the required skills and experience are critical during the initial phases of the JT&E, the JFS should include in the coordination process the requirement for personnel with the requisite skills on a temporary basis until the permanent personnel arrive. The JFS should strongly recommend that all JFS personnel remain in place and transition to the JTF.

CHAPTER 5

CLOSE DOWN/TRANSITION TO JTF

A. INTRODUCTION

Close down is the last phase of the JFS and perhaps the most demanding in terms of the work to be accomplished within the time available. The FSD should initiate the development of a simple Close Down Plan (CDP) early in the JFS to identify those actions that must be accomplished and a schedule for their accomplishment in a logical order. The identified actions will include the preparation and coordination of the final report, transition or release of personnel, preparation of efficiency reports, awards and recognitions, the transfer of property, termination of contracts and support agreements, the close out of fiscal accounts, and the return or transfer of facilities.

B. FINAL REPORT COORDINATION AND BRIEFINGS

Preparation of the JFS final report should start early and continue in parallel with completion of JFS activities. *Some of the report is boilerplate that can and should be developed as early as possible.* Sections of the report should be completed as data and information are collected and analyzed, and conclusions are reached relative to the feasibility issues. A final draft of the report should be completed in sufficient time to allow for coordination with OSD, Joint Staff, the SAC, and the Services. This coordination should be in accordance with the coordination chain previously established. It should be noted that it has not been uncommon for this coordination to

take up to six weeks with the resulting revisions and follow-on coordination taking another two weeks.

The FSD should present briefings on the conclusions and recommendations of the JFS to key DoD, Joint Staff, and Service organizations in conjunction with coordination of the JFS final report and APA. *These briefings are particularly important for gaining acceptance and support of the JFS recommendations.* Conduct of these briefings can be time consuming and will necessitate planning and coordination to maximize the number of briefings that can be accomplished on each trip. Read-ahead copies of the briefings should be provided to the respective organizations in order to maximize the available time.

The final report and the APA will be presented to the TAB for concurrence and to the DDT&E for approval.

Finalization, production, and distribution of the approved JFS final report should be completed at least two weeks prior to the scheduled close down date. Any continuation of work on these documents after that date can be affected by the administrative and logistical actions associated with the close down. These actions include the transfer of the remaining assets (computers, printers, ADP, desks and office equipment, etc.) back to the controlling organizations or agencies and the transfer of the facilities back to the host installation.

C. PERSONNEL

Most of the JFS personnel will have been assigned on a TDY basis. If the JFS results in a chartered JTF, the JTF will require full-time personnel, and the Service personnel systems can take up to 14 months to provide permanent change of station (PCS) personnel. The JTF may have to operate for roughly one-half of its life cycle before full staffing of Service personnel occurs. Initial JTF activities will depend primarily on the expertise and resources that can be transitioned from the JFS and what can be obtained through contractor support. The FSD must consider this in the development of his close down plan. The FSD should recommend that whenever possible, JFS personnel and resources should transition to and become the core element of the JTF. The JFS should also note and comment on the experience and expertise developed by support contractors during the JFS.

In the event that JTF charter probabilities are low, the FSD should develop a schedule for the release of all assigned personnel. Service personnel will return to their parent organizations, and Civil Service personnel will be assigned to organizations on the host installation in accordance with this schedule. The FSD should alert the host installation Human Resource Office (HRO)/Human Resources Department (HRD)/Civilian Personnel Office (CPO) of the projected JFS completion date as early as practical and of the necessity to find jobs for the Civil Service personnel. Contractor personnel are a unique asset and often constitute the most stable personnel resource available to the JFS during close down because they do not

have the same reassignment pressures as the military or Civil Service personnel. Thus, they will most likely remain available to support the JFS up to the closing date. Contractor personnel may also be required to fill voids created by the early release of military personnel. The use of contractor personnel to provide this augmentation may necessitate a revision of the support subtask to assure that the required support is within the scope of the contract.

During the close down phase, the FSD should give special attention to personnel efficiency and appraisal reports. In that the personnel are assigned on a TDY basis, this involves providing inputs to the individual's rating official. In the case of both military and Civil Service personnel, failure to provide timely input to their appraisal or efficiency report could result in the completion of an annual appraisal by a supervisor who has had little or no time to observe the individual's performance. The intensity of activity during the close down phase and the focus on work completion often result in appraisal inputs being overlooked or hastily provided. Once again, the CDP should include time for preparation of quality inputs into the military and Civil Service personnel appraisal systems.

As the JFS nears completion, attention needs to be given to the recognition of those personnel and organizations that have provided extraordinary support to the JFS. Since the military personnel will be in a TDY status, award recommendations or recognitions will most likely be forwarded to the parent units. Civil Service recognitions should be coordinated with the host installation HRO/HRD/CPO.

D. DISPOSITION OF ASSETS

Close down of the JFS will involve the disposition of property and facilities. If the charter of a JTF is probable, the FSD should make every effort to transfer *all* JFS property and products to the JTF. This includes all administrative and technical library documents, databases, forms, procedures, etc., that were acquired or developed during the JFS. If charter is not probable, the FSD should plan to dispose of these assets in accordance with the appropriate policies and procedures. Contact the OSD JT&E Coordinator for disposition information and instructions related to JFS-unique material.

Property

The JFS may end up with two different owners of property that must be disposed of, Service and OSD.

Service Property provided or purchased by a Service remains the property of that Service and will be returned when no longer needed. Return of the property should be coordinated through the Service JT&E POC who will define disposition procedures. An inventory of all such property will be conducted prior to the physical transfer.

OSD Property provided by OSD or purchased with DDT&E funds is the property of DDT&E. OSD property will be returned to OSD control when no longer required for the JFS mission. An inventory of all such property will be conducted prior to the transfer. In the case that a follow-on JTF is probable, the FSD will

coordinate with the OSD JT&E Coordinator relative to the transfer of JFS property to the JTF. In no case should the FSD take any action or make any commitments regarding the disposition of OSD property to another JFS, JTF, or other organization without prior coordination and approval of DDT&E.

Facilities

The return of JFS facilities will be in accordance with procedures coordinated between the FSD, the lead Service JT&E POC, and the host base installation office.

E. JFS PRODUCTS

The JFS will produce products that have value to areas other than the chartering decision process. Such products include models, simulations, and databases used or produced during the JFS.

Models and Simulations

If the JFS has adapted or developed a model for its use, it represents a product of the JFS. The lead Service will retain a copy of all models and simulations used in JT&E programs for use in future JT&Es that may have a need for them. A JFS that acquires, modifies, or develops a model or simulation will provide the lead Service modeling and simulation agent with the model or simulation, to include the documentation (user instructions and technical details regarding the model's structure) required for subsequent use or modification of the model or simulation. The FSD will provide the lead

Service modeling and simulation agent with the identification of those agencies that have expressed an interest in the model and a list of agencies to which copies of the model have already been provided.

Data and Databases

Considerable JFS efforts were expended in the collection of data and development of a database. These data represent a product that should be archived and protected from corruption to ensure their availability to other JT&E and Service programs. If a JT&E charter is probable, all JFS data and databases should be transferred to the JTF. As with models and simulations, each Service has a principal recipient of JT&E databases and controls their transfer to other agencies. The FSD will also identify agencies that have expressed an interest in the JFS databases (or portions thereof) and agencies to which copies have already been provided.

Documents and Reports

All technical documents (observations, findings, recommendations, results) and reports produced by the JFS will be approved by DDT&E prior to archiving in supporting technical libraries. Copies of all approved technical documents and reports should be forwarded to the AFOTEC library for permanent storage. The address for the AFOTEC library is listed in Chapter 2. Copies of all DDT&E approved technical documents and reports that are pertinent to the DoD mission, contribute to the DoD or

national scientific or technological base should also be forwarded to the Defense Technical Information Center (DTIC). Procedures for submission of technical documents and reports to DTIC can be obtained by contacting:

Defense Technical Information Center (DTIC/OCP) Cameron Station Alexandria, VA 2304-6145 Telephone: (703) 224-6847
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F. CONTRACTS AND SUPPORT AGREEMENTS

All contracts and support agreements that were established by the JFS should be closed out. Some may require special actions associated with the close out. The OSD JT&E Coordinator is skilled in contract negotiations and is available to assist in this area. One of the actions required in contract close out is a review of the contract relative to completion date, level of effort, and scope. The contract should be evaluated in terms of JFS requirements yet to be accomplished, remaining resources and level of effort to accomplish these tasks, and the funding available to complete the work. If it is determined that no additional support is required, then action should be initiated to close out the contract(s). The FSD should also take the necessary actions to terminate all support agreements with host-installation and supporting organizations and agencies.

G. CLOSE OUT OF FISCAL ACCOUNTS

Even after a JFS closes its doors, the cleanup of financial matters will continue. Late billings and final contract dispositions create requirements for funds after the JFS is

disestablished. The OSD JT&E Coordinator will provide fiscal assistance relative to close out activities if the chartering of a JTF is not expected. If chartering is expected, the cleanup of JFS bills and funding should transfer to the JTF.

ANNEX A

LIST OF ACRONYMS

ACC	Air Combat Command (Air Force)
ACTD	Advanced Concept Technology Demonstation
ADP	Automated Data Processing
AFOTEC	Air Force Operational Test and Evaluation Center (Air Force)
ALSA	Air Land Sea Agency
APA	Analysis Plan for Assessment
CATEX	Categorical Exclusion
CDP	Close Down Plan
CINC	Commander in Chief
COI	Critical Operational Issue
COMSEC	Communications Security
CMC	Commandant of the Marine Corps (Marine Corps)
CNO	Chief Naval Operations (Navy)
CPO	Civilian Personnel Office
CPX	Command Post Exercise
CRE	Consolidated Resource Estimate
DESA	Defense Evaluation Support Activity
DCSOPS	Deputy Chief of Staff for Operations (Army)
DC/S R&P	Deputy Chief of Staff for Requirements and Programs (Marine Corps)
DDT&E	Deputy Director, Test and Evaluation
DIA	Defense Intelligence Agency
DMAP	Data Management and Analysis Plan
DoD	Department of Defense
DoDD	Department of Defense Directive
D,T,SE&E	Director, Test, Systems Engineering and Evaluation
DTD	Deputy Test Director
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FDMC	Fiscal Director Marine Corps (Marine Corps)
FFRDC	Federally Funded Research and Development Center
FMF	Fleet Marine Force (Marine Corps)
FOA	Field Operating Agency (Air Force and Army)
FONSI	Finding of No Significant Impact
FSD	Feasibility Study Director
FY	Fiscal Year
FYTP	Five Year Test Plan
GOSC	General Officer Steering Committee
HQMC	Headquarters Marine Corps (Marine Corps)
HRD	Human Resource Department
HRO	Human Resource Office
IDRL	Integrated Data Requirements List
IPR	In-Process Review
JADO/JEZ	Joint Air Defense Operations/Joint Engagement Zone
JCCD	Joint Camouflage Concealment & Deception
JCS	Joint Chiefs of Staff

JDC	Joint Doctrine Center
JFS	Joint Feasibility Study
JMEM	Joint Munitions Effectiveness Manual
JPO	Joint Program Office
JT	Joint Test
JT&E	Joint Test and Evaluation
JTAMS	Joint Tactical Missile Signature
JTD	Joint Test Director
JTF	Joint Test Force
MACOM	Major Command (Army)
MAJCOM	Major Command (Air Force)
MCO	Marine Corps Order
MCOTEA	Marine Corps Test and Evaluation Agency (Marine Corps)
MCSYSCOM	Marine Corps Systems Command (Marine Corps)
MCSYSCOM/T&E	Marine Corps Systems Command/Test and Evaluation
MLM	Mission Level Measure
MOA	Memorandum of Agreement
MOE	Measure of Effectiveness
MOT&E	Multi-service Operational Test and Evaluation
MOP	Measure of Performance
NEPA	National Environmental Policy Act
N091	Office of Director of Test and Evaluation (Navy)
N912D2	Office of Director of Test and Evaluation and Technology Requirements Test and Evaluation Division (Navy)
O&M	Operations and Maintenance
OPSEC	Operational Security
OPTEC	Operational Test and Evaluation Command (Army)
OPTEVFOR	Operational Test and Evaluation Force (Navy)
OSD	Office of Secretary of Defense
OTA	Operational Test Agencies
OT&E	Operational Test and Evaluation
OTP	Outline Test Plan (Army)
PC	Planning Committee
PCS	Permanent Change of Station
PID	Program Identification Document
POC	Point of Contact
POM	Program Objective Memorandum
PTP	Program Test Plan
PY	Program Year
QC	Quality Control
SAC	Senior Advisory Council
SCG	Security Classification Guide
SCI	Special Compartmented Information
SCIF	Special Compartmented Information Facility
SME	Subject Matter Expert
SSO	Special Security Office
T&E	Test and Evaluation
TAB	Technical Advisory Board
TAG	Technical Advisory Group
TDY	Temporary Duty
TEIN	Test and Evaluation Identification Number (Navy)
TRP	Test Resources Plan (Air Force)
TSARC	Test Schedule and Review Committee (Army)
WBS	Work Breakdown Structure

ANNEX B

GLOSSARY OF TERMS

Analysis Plan for Assessment (APA)

A document published by the JFS team that stipulates what actions must be accomplished by a JTF in order to collect and analyze sufficient data to resolve the JT&E issues and/or concepts. The APA specifies what must be done in sufficient detail so that the JFS team can quantify the resources required to accomplish the JT&E.

Battalion Training Strategy (OPTEMPO)

The actual cost of parts and fuel to operate annual miles for vehicles and hours for aircraft executing training in the field army.

Critical Operational Issues (COI)

The major issues (questions/problems) that a JT&E is addressing, usually phrased in the form of a question.

Data Management and Analysis Plan (DMAP)

A program level document that details what data will be collected, how it will be cataloged, stored, controlled, analyzed, and archived. The program DMAP also contains detailed procedures for these functions. A DMAP may also be required to detail what and how data will be collected, managed, and analyzed for a specific test activity.

Defense Evaluation Support Activity (DESA)

A DoD support organization available to JFS and JTF teams for advice and support regarding virtually all aspects of JT&E.

Designated Support Agent

That organization or Agency that is designated by competent authority to provide support to a JFS. Frequently referred to as the support agent.

Environmental Assessment (EA)

A study, required by the National Environmental Policy Act (NEPA), to determine if significant environmental impacts are expected from a proposed activity.

Environmental Impact Statement (EIS)

A report required by NEPA that describes the environmental consequences of a proposed activity.

Feasibility Study Team

The personnel who perform a JFS.

Feasibility Study Director (FSD)

The person appointed as responsible for the conduct of the JFS.

Free Play

Activities of a player staff as it responds to stimuli provided by the control structure of a "game," where the stimuli are logical consequences of previous player actions. In this context, a game is some representation of the real world intended as context for training of the player staff.

General Officer Steering Committee (GOSC)

A group of General Officers from the Services interested in a particular JT&E issue or operational concept who are invited by the FSD

to advise on issues of doctrine, policy, or tactics. The intent is to capture and integrate Service representation in the JFS at a senior officer level.

Instrumentation

Equipment used during a test activity to capture and record data.

Issue

A question that a nomination poses that a JT&E will resolve. The measures and data elements are designed to resolve the issues.

Joint Feasibility Study (JFS)

A formal study undertaken to determine whether a proposed JT&E should be chartered for execution by a Joint Test Force (JTF).

Joint Test Director (JTD)

The person appointed as responsible for executing a charted JT&E and directing the efforts of the JTF. Should be at least an O-6 (possibly GS-15) with test and evaluation experience and a background in the technical aspects of the nomination.

Joint Test and Evaluation (JT&E)

Those activities dedicated to addressing an issue or concept that was nominated by OSD, Joint Staff, CINC, or the Services and has been chartered by OSD to be conducted by a JTF.

Joint Test and Evaluation (JT&E) Program

Those activities managed by DDA&SP for the DoD, including all active and proposed JFSs and JTFs. Frequently the JT&E program is confused with the actions of a JTF, which are to conduct a joint test and evaluation dealing with an issue or concept. The JT&E program includes all functions that support the JT&E, for example the convening and support of JT&E planning

committees, SACs, TABs, GOSCs, and program and budget functions.

Joint Test Force

A formal organization lead by a JTD and staffed by the Services for a specific time period to conduct a JT&E under the auspices of an OSD charter.

Measure of Effectiveness (MOE)

A quantifiable entity that expresses the effectiveness of a system or concept under test. An MOE can also be defined as an algorithm which uses data to be collected to compute a quantity called the measure.

Mission Level Measure (MLM)

A quantitative or qualitative measure of a systems capabilities or characteristics in terms of their effect on the mission of which the system is a part.

Measure of Performance (MOP)

A quantitative or qualitative measure of a system's capabilities or characteristics.

Nomination

The process used to bring joint issues and concepts to the attention of the DDA&SP.

Objectives

Objectives are designed to focus attention on those areas that require or involve test activities to resolve the issues or concepts being tested. Activity progress can be measured in terms of attaining the test objectives.

Outline Test Plan (OTP)/Test Resource Plan (TRP)

Resource requirements documents used by the Army and Air Force respectively for users to specify personnel and equipment requirements to be used in the support of joint test activities.

Piggyback

A form of testing where a joint test force uses deployed resources of one or more Services for testing before, during, or after a concurrently scheduled Service or Joint Staff training exercise in order to collect data.

Program Analysis Methodology

That portion of the PTD that defines what analysis must be done using the collected data elements to address all of the issues.

Program Test Plan (PTP)

The document that specifies in detail the procedures for conducting the test activity; collecting, processing, verifying, storing, and transporting the required data; and producing the required reports.

Quick-Look

Those procedures established to assure that the amount and quality of data being collected during test activities is adequate.

Reconstruction

A posttest analysis process used to verify the accuracy of collected data by alignment of the data to test activities.

Senior Advisory Council (SAC)

An advisory body that reviews selected nominations, the results of JFSs and JTFs, and recommends appropriate actions to the D,T,SE&E.

Service Deputy

A senior person appointed by a Service to participate in a JFS. Serves as a functional member of the JFS while representing the interest

of the appointing Service. Should be an O-5 or O-6 with test and evaluation experience and a background in the technical aspects of the nomination.

Technical Advisor

A JFS member designated by the FSD to advise on technical matters and to resolve any technical differences of opinion within the JFS. The technical advisor is responsible for keeping JFS activities focused on chartered concepts and/or issues.

Technical Advisory Board (TAB)

A group of senior scientists, engineers, and analysts who advise the DDA&SP, SAC, JT&E PC, FSDs, and JTDs on technical matters relevant to JT&Es.

Technical Advisory Group (TAG)

A advisory body formed to provide direct technical support and advice to a JFS. The TAG composition is similar to the TAB but is not as senior.

Test Activity

A collective term used to describe a total series of related tests or studies conducted to collect and analyze data. Test activities can range from analysis using studies and models to field tests that involve deployed combat units.

Test Manager

A JTF member responsible for the planning, execution, and reporting of a specific test activity.

ANNEX C

POCs for JT&E SUPPORT

OSD	DDT&E Tel - (703) 697-3406 FAX - (703) 614-7040 E-Mail LEDESMAR@ACQ.OSD.MIL	JT&E Coordinator Tel - (703) 578-6581 Fax - (703) 578-6583 E-Mail BLOOMELE@ACQ.OSD.MIL
JCS	Joint Staff/J8 Tel - (703) 694-9759 FAX - (703) 694-6601	
USAF	USAF/TEP Tel - (703) 695-0900 FAX - (703) 695-0803 E-Mail BRECHWAJ@TEP.HQ.AF.MIL	AFOTEC/XRJ DSN - 246-5339 Tel - (505) 846-5339 FAX - (505) 846-5214 E-Mail MAGEEW@P3.AFOTEC.AF.MIL
USA	DCSOPS (DAMO-FDR) Tel - (703) 697-4044 FAX - (703) 614-2675 E-Mail AGOSTA@PENTEMH8.ARMY.MIL	OPTEC CSTE-OPM Tel - (703) 681-6518 DSN - 289-6518 FAX - (703) 681-7584 E-Mail YOUNGA@OPTECI.ARMY.MIL
USN	OP 912D2 Tel - (703) 697-1485/0181 DSN - 227-1485/0181 FAX - (703) 697-1070	
USMC	MCSYSCOM Code (TE) Tel - (703) 784-5964 FAX - (703) 784-3432 E-Mail MEADP@MQG-SMTP3.USMC.MIL	
DESA	DESA-BMC Tel - (505) 262-4529 Fax - (505) 260-2759 E-Mail HOLMESB@DESA.OSD.MIL	

ANNEX D

RELATED JT&E DOCUMENTS

DoD Instruction 5000.2

This DoD Instruction provides the basic framework for the Test and Evaluation of programs sponsored or supported by OSD.

DoD Manual 5000.3-M-4

This manual provides a description of the joint test and evaluation nomination and selection process, describes the organizational framework within each Service which supports the program, and identifies principal participants and their respective responsibilities.

DoD Manual 7110.1-M1

This manual outlines the procedures for the distribution and use of OSD funds in support of OSD sponsored or supported projects.

DoD Manual 5220.22-M

This manual provides detailed information relative to the Government Information Security Program for safeguarding classified information.

DoD Directive 3200.11-D

This directive is a summary of Major Range and Test Facility capabilities.

DoD Directive 3200.12

This directive outlines the mission, responsibilities, and functions of the Defense Technical Information Center (DTIC). Copies of all approved JFS generated technical documents and reports should be forwarded to DTIC.

DoD Directive 4120.14

This directive establishes guidelines relative to Environmental Concerns for DoD programs.

DoD Directive 5230.24

This directive establishes the requirement for all managers of technical programs to assign distribution statements to technical documents generated within their program.

DoD Directive 6050.1

This directive is a list of activities that previously have been found to have no detrimental effects on the environment and do not require an EA or EIS.

DIA Regulation 55-3

This regulation is a guide for obtaining threat information support.

DoD Regulation 5200.1-R

This regulation establishes requirements relative to the government information security program.

Memorandum of Agreement on Multi-Service Test and Evaluation and Joint Test and Evaluation

This MOA provides the basic framework for T&E conducted by two or more Operational Test Agencies.

Joint Feasibility Study Handbook

This handbook consolidates OSD guidance and direction, information, references, and procedures on conducting a Joint Feasibility Study.

Joint Test and Evaluation Handbook

This handbook consolidates OSD guidance and direction, information, references, and

procedures on conducting a Joint Test and Evaluation.

AFOTEC Instruction 99-101

This instruction provides the guidelines and procedures for the AFOTEC conduct of OT&E on Air Force systems. The instruction contains guidance relative to resource planning and funding of Joint Test and Evaluations.

AFOTEC Pamphlet 55-8

This pamphlet is a guide for resource managers and test managers on procedures for preparing the Test Resource Plan (TRP).

Army Regulation 15-38

This regulation provides guidance and establishes procedures governing the Test Schedule and Review Committee (TSARC).

Test Schedule and Review Committee Handbook

This handbook provides TSARC members and the user test community with a concise document that combines information from many sources for use in preparing Outline Test Plans (OTPs) for inclusion in the Department of Army Five Year Test Program (FYTP).

Marine Corps Order 5000.11B

This order establishes guidance for the Test and Evaluation of systems and equipment to be employed by the Marine Corps.

Military Standard 1806

This standard provides procedures for marking scientific, technical, engineering, production, and logistics technical data, to denote the extent to which they are available for secondary distribution.

ANNEX E

STRUCTURED APPROACH FOR DEFINING JOINT TEST MEASURES

A. INTRODUCTION

Ensuring that the necessary and sufficient set of measures is identified requires a comprehensive development of the issues and subissues. The issues presented at nomination can lead to a JT&E that is too broad to be executable within resources constraints or too narrow to address the problem. This annex presents an approach to translating the issues into measurable entities.

B. TYPES OF JT&E

Understanding the problem to be solved is essential to developing a structured approach. The problem should fit into one of the five areas defined for a JT&E Program in *DoD 5000.3-M-4*. These are to:

- Develop and analyze testing methodologies.
- Evaluate technical and operational concepts.
- Provide information on system requirements and improvements.
- Examine systems interoperability.
- Evaluate technical or operational performance under realistic conditions of interrelated/interacting weapons systems.

From the test developer's point of view, these fall into two types of JT&Es: Methodology development and "evaluation" tests.

- **Methodology development** includes all aspects of development and validation of the methodology concepts and procedures. Methodology development does not usually

involve systems development, but systems integration may be necessary, and interfaces and assessment tools may need to be developed.

- "Evaluation tests" involve comparisons between two or more systems, concepts, or sets of procedures. An "evaluation" test may rate systems, concepts, or procedures against a set of criteria and may require development of that criteria.

These two classes of JT&Es involve different analysis methodologies and consequently different types of structured approaches. Further, JT&Es vary widely in scope and may fall into one category or the other or fall along a continuum involving both methodology development and "evaluation" tests.

A good example of a nearly pure methodology development JT&E is the Joint Tactical Missile Signature (JTAMS) joint test. JTAMS was chartered to develop methods and procedures for determining missile signatures, establish a database of missile signatures, and structure a method for coordinating missile signature requirements. These issues all relate to building a capability to satisfy a stated need and, therefore, require a problem resolution approach.

An example of a nearly pure "evaluation" JT&E is the Joint Air Defense Operations/Joint Engagement Zone (JADO/JEZ) joint test. JADO/JEZ was chartered to determine how well a JEZ can be implemented to increase effectiveness of air defense forces and to

determine under what conditions a JEZ is more effective than current air defense doctrine, tactics, and procedures. JADO/JEZ represents the more classic operational evaluation test. The purpose of this is to make comparisons between different concepts in order to determine which is more effective.

Examples of structured breakdowns from previous joint feasibility studies and joint test and evaluations are contained in the PTDs for those JT&Es. Copies of these PTDs can be obtained from the JT&E library.

The point is that different types of JT&Es use different analysis methodologies and this difference extends to the development of the structured approach. Each potential JT&E will take on a character that reflects the type of issue being investigated. An issue on joint interoperability, for example, requires development of measures that will assess how systems or activities perform or support one another. An issue relating to the development of a joint testing procedure must be approached in a manner that defines measures that lead to the establishment of a comprehensive test method.

Methodology development issues can be resolved by other test methods, such as development of software and hardware or analysis of available information. The approach for methodology development issues will be a sequential step-by-step plan for defining and developing the procedures and methodologies needed to satisfy the requirement.

"Evaluation" test issues lend themselves to investigation and resolution by identification of attributes that are quantifiable and measurable. The structured approach for an "evaluation" test issue establishes a data trace that

ties planned collection of data elements to the issues.

The process of systematically breaking major test issues into smaller segments until the attributes of each segment can be quantitatively answered is similar for all JT&E issues. However, the focus for a methodology development issue is on defining the necessary steps for satisfying the step-by-step procedures needed to produce an item to meet requirements. The focus for an "evaluation" test issue is on gathering data to make comparisons. Therefore, the analytical structure takes on a different character. A development task structure is one geared to ensuring achievement of a goal and production of a product. The "evaluation" task structure is configured with steps to permit determination of relative values.

C. TEST STRUCTURE DEVELOPMENT

Development of a structured approach is the first step in the plan for addressing the joint feasibility study goals, objectives, and issues. Time and resources will most likely preclude the structured approach from addressing every aspect of the concept or problem. The approach should, therefore, include sensitivity analysis and trade-off studies of the tasks in the JT&E concept to identify and quantify those specific areas that show the greatest potential for resolution of the JT&E issues(s). This structure becomes the basis of the other planning tasks, i.e., selection of the test methods, development of the test method matrix, and identification of resource needs. Each of these tasks requires a thorough understanding of the problems that led to the feasibility study issues. Without this understanding of the environment, it is impossible to structure an approach that

encompasses all the aspects that must be examined in adequately addressing the issues.

Whatever the type of the test issue, a structured approach should be developed to formalize the process that will provide information about the issue. One approach to defining how issues will be addressed is the establishment of a hierarchy in which the issues are at the highest level. These, in turn, are supported by subissues, sub-subissues, and, finally, measures. It is difficult to standardize labels for the different levels of this structure because the four Services use different labeling conventions. However, most examples from Department of Defense (DoD) publications show a structure that develops issues from the problem that the JT&E is to solve, decomposes the issues to a level that they can be addressed by measurable quantities, develops those measures, and defines supporting data elements. The discipline of using this analytical hierarchy (dendritic) type of architecture may appear to thwart creativity, but the structure it provides to the test design process outweighs any possible loss of creativity.

The thrust of this breakdown is to subdivide the test issues into more explicit questions or subelements that can be addressed by data gathered by test events. The formation of measurable attributes may occur at different levels depending on the issue. That is, one issue may have a subissue that leads immediately to quantifiable attributes, while another issue may need to be subdivided to the sub-subissue level before measurable attributes are evident. **Figure E-1** outlines the attributes of the structured approach levels.

The structured approach process fosters discipline and accountability. To implement this approach the analyst breaks the issue down into

smaller and smaller segments by asking, "what do I need to know to answer this question?" Each level of the structure is given a title, i.e., subissue, sub-subissue, measure, or data element. However, there are no set number of levels. This process of building this structured method establishes the analytical approach that will be used to address the issues. Also, the analytic structure preserves the organization and logic of why specific data are required and, therefore, serves as an audit trail. The decisions made in establishing the subelements at each level focus the planning in a specific direction. The joint feasibility study staff must understand and consider how these decisions will impact the JT&E, as it will require the collection of specific data during the planned test activities and require that the analysis be performed in a particular manner. Each decision has major resource considerations.

The structured approach process can be misleading because it seems to imply "just continue to analyze and breakdown the problem into measurable parts." In fact, construction is often inductive, not deductive, and requires creativity.

Implied in the nomination objectives are mission-related objectives that are to be achieved to successfully address the problem that the JT&E is to solve. The issue focuses the analysis, but the analysis must also consider these overarching objectives. For example, the issue could be to find a means to reduce resource (input) requirements, but the implied objective would be to maintain the output quality or to optimize the cost-benefit relationship. Conversely the issue could be to improve the output, and the implied considerations would involve the impacts on resource requirements and the processes and organizations involved.

ISSUES

- Questions to be resolved and starting point for structure
- Statement of issue normally part of the nomination submission
- If multiple issues, then each is addressed individually
- Not a quantifiable level
- Supported by level labeled "subissue" or "measure"
- Subissues may not equally support the issue

SUBISSUE

- Usually forms the second level of structure
- Addresses major subelements of issue (normally part of nomination submission)
- Not a quantifiable level
- Answered from information obtained at lower levels of dendritic via an interpretation
- Supported by level labeled "sub-subissues" or "measures"
- Sub-subissues may not equally support answering issue

SUB-SUBISSUE

- Subelement of subissue (usually developed by feasibility study team)
- Not a quantifiable level
- Answered from information obtained from measures via interpretation/application
- Supported by measures that are quantifiable
- Measures may not equally support answering the sub-subissue

MEASURES (MLMs, MOEs, or MOPs)

- May be developed in:
 - Conventional manner - defines function or process as attributes in quantifiable terms
 - "Reverse engineering" - derived by decomposing products into critical components or processes
- Addresses major subelement (attribute) of sub-subissue
- Highest quantifiable level
- Usually a set number of data elements required to address
- Confidence/completion is a function of the number of data sets accepted as valid for use in analysis

Figure E-1. Attributes of Structured Approach Components

Consequently, the analysis required to resolve an issue is more complex than simply turning a crank to factor the issue into ever smaller subissues. It usually will require consideration of the problem from a more holistic or upward approach in addition to the downward approach. Regardless of the analytical approach, there will be a limit to the test resources, and therefore, once the context of the problem is defined, the challenge is to scope the test design down to efficiently address the problem.

With respect to military systems there are usually well-defined missions and system objectives, and the trace from measurable system requirements to mission objectives is derived by analysis. Decomposition of missions into functional processes and finally into system attributes is a common analytical approach (sometimes referred to as a dendritic due to the dendritic or tree-like form of the resulting analytic structure). Unfortunately, this approach usually results in a complex analytical structure that

defines many more compositional elements than a reasonable test could measure. The problem can be simplified by considering only the critical decomposition elements of the mission or objective function. Inherently, this means that the elements of the problem are not equally weighted and the analyst has either conducted sensitivity analyses in early trade-off studies or has applied judgment to select (or deselect) the critical factors that will be measured and consequently drive the evaluation.

The application of analytical judgment is not a flaw, it is a practical necessity. In fact, judgment and even creative intuition may be more useful in developing the analytical structure than a rigorous methodology such as early trade-off studies with attendant sensitivity analysis. Judgment should not be eschewed, but should be recognized as fundamental to the analytical process, and the rationale and sensitivities of analytical judgments should be consciously addressed.

If the analytical structure is based on a decomposition of one or more issues or objective functions, it is important to recognize that many subelements may have a common attribute; i.e., the subelements will not be mutually exclusive factors. For example, system speed could contribute to many functional processes and consequently could contribute to mission effectiveness in many ways. Thus one would expect the measure of system speed to be a factor in many subelements, and the evaluation must deal with how to aggregate the impact of system speed.

Another consideration when using functional decomposition as an analytical approach is that a dendritic is not a good model for system attributes that have interactions or interdependencies. For example, night vision

and muzzle flash suppression both contribute independently to mission effectiveness, but there is also likely to be a synergistic relationship that is not apparent from a simple dendritic. Conversely, good cockpit lighting and good night vision goggles could be a dysfunctional combination.

If it is recognized that determining the effect of interactions and interdependencies is fundamental to the purpose of the test, the test design could be driven more by an articulation of the variables and consideration of what might be the critical combinations of the variables. In that case, it may be more useful to consider the variables of interest and methods to model these relationships than to decompose the objective functions implied by the issue statement.

A rigorous analytical structure will not compensate for lack of common sense. The dendritic is a necessary part of the evaluation, but it must be related back to mission-related, operational considerations to be meaningful. Some factors to consider include:

- The analytical structure should factor explicit or implied overarching objectives into elements that comprise an objective function.
- Many of the sub-elements of a rigorous functional decomposition may not be critical to the issue at hand.
- The statement of the issue focuses the test and evaluation on those sub-elements that are critical to resolve the issue.
- Care should be taken to ensure that critical elements defined by the issue are not a suboptimized statement of overarching objectives.
- The test design should be based on measuring the critical elements in combinations that will identify the interactions and interdependencies.

While exploring different avenues to satisfy test requirements, a JFS team must not only determine what is feasible, but also the minimal questions that must be answered. Therefore, the team needs to focus its efforts on scoping the planned program to a limited number of subissues that support the program issues. A highly successful method for selecting subissues starts with a screening process in which all suggestions are considered. Frequently, several proposed subissues can be combined into one. The result should be the minimum mutually exclusive set of critical factors or questions that fully comprise the issue.

Frequently, because of the complexity of a JT&E or an issue, it is necessary to subdivide subissues into sub-subissues. This should only occur when the subissue itself is so complex that it can logically be decomposed into non-quantifiable questions. It is possible for one subissue to require sub-subissues and another subissue under the same issue to not require further breakout. Any path from issue to data element does not require the same number of steps as any other path.

D. MEASURE DEVELOPMENT

Eventually, an analysis structure will be defined that will answer the issue by evaluation of specific well-defined measures. The measure is the quantifiable level and should be objective. The conventional manner of developing measures is to extract measure statements from the subissue or sub-subissue attributes. Well-designed measures should meet the criteria listed in **Figure E-2**.

Another technique that helps the joint feasibility study team to focus the data collection toward satisfying the issues and to communicate

very precisely with one another is to relate system or concept attributes to measures. Those attributes that lend themselves to being addressed by a graphical display can be expressed in terms of a subjective evaluation or an equation that models the relationship even though cause and effect are not established. Then the data elements needed to satisfy the equation can be defined.

Another technique that may have some application is "reverse engineering." This technique involves the identification of what data must be generated to determine whether a test is successful or not. Reverse engineering places emphasis on what type of products are desired to support issue resolution. The reverse engineering approach is based on being able to visualize the contribution of system attributes in the form of a product or effectiveness. In order to have the capability to generate analytical displays, the attributes must be expressed in terms of quantifiable data that can be collected and associated to provide a measure of some capability. By knowing the type of decision that must be reached to evaluate an attribute, one can determine the measurable test data and assessments that must be used to arrive at a value, or range of values of effectiveness. The required measurements and data elements that must be collected can then be defined.

Both the breakout of measures via the structured approach process and the "reverse engineering" process achieve the same goal, the identification of data that must be collected to answer the sublevel question. The difference is a subtle one. While the traditional approach focuses on the data that needs to be collected to answer an issue, the "reverse engineering" approach focuses on what should be reported as a logical outgrowth of data collected.

- 1. The measure must be relevant.** Each measure must directly relate to the issues and test design that have been identified. The measure should not be overly broad and should involve only items that affect the issues of the nominated tests.
- 2. The set of measures should be complete or exhaustive.** Any input variable that affects the system's ability to perform its mission should appear as some sort of input to a measure and should cause change in the value of the measure as it is varied (i.e. Its sensitivity is assessed relative to input variables over a realistic range of values).
- 3. The measure should be precisely defined,** so that there is no possibility of misunderstanding what is meant by the measure.
- 4. The set of measures should be mutually exclusive, if possible.** If this is not the case, one input may weigh several measures and thus be counted several times, so as to have a disproportionate effect on test results.
- 5. The measure should be expressed in terms that are meaningful to both testers and decision makers.** This test must be clear and precise to ensure that the meaning is not in doubt after passage of time and examination by new personnel.
- 6. Inputs that make up the measure should be measurable in some fashion, preferably quantifiably.** If qualitative measurements must be used, they should be judged against some standard criteria.

Figure E-2. Desired Qualities in a Measure

In all cases the analytical structure developed to ensure a systematic approach to the solution provides the structure for tying data element requirements to the analytical approach. This device is termed a "data trace" and provides the basis for supporting the collection of specific data elements. The data trace also proves useful in identifying data sources and instrumentation/collection requirements. Data requirements not directly tied to a level in the structured approach must be examined to determine their value. The data trace can aid determination of resource requirements and assessments of the impact of the inability to obtain data due to the absence of a test vehicle or instrumentation.

In the development of a structured approach, the statement of the questions or measures at each level must provide an

achievable step-by-step development with check points as to the suitability of the development. For an evaluation task, the structured approach level questions are configured to compartment the subject into segments where common measurements are possible and one-to-one comparisons can be made. Therefore, the developer of each structured approach needs to recognize that, based on the orientation of the stated issue, different approaches are needed. After the structure has been developed through the measure level, **Figure E-3** gives a checklist that can be used in assessing the adequacy of the developed approach.

Has the structured approach allowed for analysis of critical issues/variables?	Y	N
Do all the measures relate to the issues/variables being considered?	Y	N
Does the structured approach allow for progress evaluation?	Y	N
Has the full structured approach been included in the APA?	Y	N
Is the structured approach consistent with the APA?	Y	N
Does the structured approach support derivation of conclusions?	Y	N
Are the measures linked or linkable to the issue(s)?	Y	N
Can the measures be quantifiably or qualitatively determined?	Y	N
Is the sensitivity of the measure weights clearly analyzed?	Y	N

Figure E-3. Structure Checklist

ANNEX F

TEST METHODS

A. INTRODUCTION

This annex describes the various test methods that a JT&E could employ; in effect, the tools that are available to address the program issues. The list of methods is lengthy, but not exhaustive. There are two basic tools for accomplishing the JT&E efforts. These are 1) problem solving, and 2) testing (e.g. assessments, evaluations, or validations). Some of the relative costs and benefits associated with each method are discussed in the following paragraphs and are summarized in **Figure F-1**. The advisability of using one or more of the methods will depend on specific test requirements and on such factors as availability, credibility, cost, or acceptance of test results by the Services, fidelity of the test data, test site location, and available support.

The JFS will make an initial determination of test methods as part of the APA development. JTF coordination for the actual use of the resources to conduct the test activities may determine that some are not available when needed or some are too costly.

B. PROBLEM SOLVING

Most JT&Es will have at least one issue that calls for fixing a problem or finding a better way. Thus, the classic problem solving process is a key player in almost all JFSs. This includes bringing together people capable of solving the problem, brainstorming for solutions, analyzing and ranking potential solutions, and selecting the

best solution. The magnitude of this effort can vary widely with the complexity of the problem.

One of the first steps in most problem solving activities is information collection. This can be as simple as referencing previous test and exercise results. Review of published documentation is the most straightforward way of collecting data and there are many excellent sources available to the JFS. These include industrial papers and studies, Federally Funded Research and Development Center (FFRDC) studies and analyses, and Service programs in the same technical field. Operational records are another good source of information. A drawback to using operational data is that it may require manipulation of the data to reveal the information of interest and may lack the fidelity or accuracy needed.

New or supplemental information may be acquired through the use of surveys or expert opinion, or the use of *validated* models and simulations. This can increase the effectiveness of operation records by filling in those areas where the operational records are weak. Validated modeling and simulations can also be used to develop new information by looking at existing data in new or different ways.

When research, modeling, or simulations do not provide the data needed, laboratory measurements may be required. With laboratory measurements, the resulting data are not compared (evaluated) against a set of criteria. Rather, the data are simply collected and reported.

TEST VEHICLES TOOLS	POTENTIAL PAYOFF	DIFFICULT TO CONDUCT	COST	JTF CONTROL
LABORATORY TEST	1	1	1	1
MODELING & SIMULATION	2-3	2-3	2-4	2
MINI-TESTS	1	2	2	1
CPX	3	3	3	4
FIELD TEST (Piggyback)	2	4	2-3	3
FIELD TEST (Dedicated)	2	3	4	1

NOTE: Values are subjective estimates where 1 represents the most desirable condition

Figure F-1. Nominal Value of Testing Options

C. TESTING

JT&Es are typically associated with activities to collect and analyze data to assess, evaluate, or validate a concept or system. Frequently, JT&E team members who acquired their testing experience with a Service test organization tend to think of testing only in regards to new Service systems, i.e. hardware and software. In reality, this focus is too narrow. For example, the interoperability of two or more systems can be assessed, the effectiveness of an operational procedure can be evaluated, or a new or revised process can be validated. JFS staff members must think in the broadest terms of testing and how test activities

will contribute to the resolution of the program issues.

An *assessment* provides an understanding of the relative magnitude of what is involved and determines the size and importance of that which is being examined in terms of a whole picture. An *evaluation* determines the relative worth or significance of that which is being evaluated (there are usually criteria which are used to aid in the evaluation process). A *validation* provides a means for corroborating or supporting something based on a sound basis. Validation creates the foundation that ties the subject being validated to an authority on that subject.

The various methods for obtaining data elements to support assessments, evaluations, or validations are discussed next.

Surveys

The term surveys is used to cover a range of methods including questionnaire and interview methods to collect data about system performance. Frequently, surveys involve the use of subject matter experts but may also be used to elicit information from typical users of a system. Surveys are useful when evaluation criteria are ill-defined, such as when gauging general improvements of a process or assessing the extent of a problem. Surveys are also useful when the feature under scrutiny does not lend itself to objective analysis, such as human factors concerns.

The cost for conducting surveys is typically much lower than assessment or evaluation methods. One factor that must be considered, however, is the cost of access to the survey participants. The fidelity of a survey is dependent on the quality and quantity of the responses from the survey participants.

Laboratory Tests

Laboratory tests are generally the least expensive and least complex type of tests to plan and execute. They are generally used to obtain engineering characteristics or specifications relative to the performance of specific systems under laboratory-controlled conditions. Such tests can range from the use of bench tests, to anechoic chambers, to antenna measurement facilities, and to system stress test facilities.

In addition to being perhaps the least expensive and simplest test to plan and conduct, lab tests provide the means to exercise the greatest control over the test and can be conducted at whatever pace is necessary to confirm and validate the data collected. Equipment can be left in its test configuration until the data are validated, and if the test needs to be rerun, the equipment is already setup and ready for repeat testing. Nearly all of the testing conditions can be rigidly controlled to preclude any outside interference on system operations and the data collection and management process. Testing can be conducted anytime based on the availability and operating hours of the test facility. Resources for conducting the test, to include test equipment and support personnel, are generally available as part of the test facility support agreement. Costs for this type of testing will be those associated with the transportation of equipment and systems to and from the test location and the TDY costs of a small team from the JFS or JTF.

In most instances, lab testing alone is insufficient to resolve program issues, because the results generally do not reflect the system's performance in an operational environment (i.e., the system's performance within operational profiles and employed by operators of varying degrees of experience attempting to accomplish an operational task). However, lab testing can be a valuable tool for obtaining operating insights and technical data on a system prior to moving into a field test where the collection of data is more difficult. In this regard, the data obtained from lab tests will ordinarily be used later in the JT&E in conjunction with data from other types of testing to address program issues and, in

designing other tests, to include mini-tests and field tests.

Modeling and Simulation

Models and simulations can vary significantly in size and complexity and can be useful test tools in several respects. They can be used to conduct predictive analyses for developing plans for individual test activities, for assisting program planners in anticipating problem areas, and for comparison of predictions of collected data and the results of discrete tests. Validated models and simulations can also be used to examine scenario differences, conduct *what-if* tradeoffs and sensitivity analyses, and to extend test results.

One sequence that has proven useful begins with model use to predict test results. Individual tests are then used to validate these predictions. Finally, the validated model is used to extend the test results to cases not tested.

The JFS team must pay particular attention to the maturity, community acceptance, and characteristics of models being considered for inclusion in the APA. Model development is expensive; similarly, a model that requires extensive modification or completion (most models can be improved) to be useful may be too expensive or time consuming for serious consideration.

A resource for the JFS to begin examination of potential models applicable to the JT&E is the *Joint Staff Catalog of Models, Simulations and Games*.

Mini-Tests

Mini-tests are small scale tests involving one-on-one or one-on-few systems conducted under operational or near-operational conditions. They are used to collect engineering data, system data, procedural data, or data on systems where personnel must be in the decision-making loop. Mini-tests are generally dedicated tests that afford complete control by the JTF. The costs of mini-tests can vary, based on factors like scope and location of the test. Generally, they are more expensive than lab tests but are considerably cheaper than field tests. In some cases, combinations of lab tests and mini-tests can provide enough data to satisfy or partially satisfy program level issues.

Mini-tests have been used by JT&Es to evaluate proposed instrumentation schemes, data collection and processing techniques, tools, and procedures for larger scale field tests. The use of mini-tests for this purpose allows the team to evaluate and revise instrumentation, equipment, and procedures and train personnel to perform the data collection tasks, thus reducing the risk of failure and the associated expense (time and dollars) during the conduct of more expensive testing.

As with costs, the planning efforts for a mini-test can vary depending on the scope of the test. In most cases, the planning efforts are rather extensive since most mini-tests are conducted at Service test facilities and ranges, and require integrating test facility resources, JT&E resources, and Service operational and support resources.

Command Post Exercises (CPXs)

CPXs are tests or exercises that are primarily procedure oriented and do not involve extensive deployment of forces. For example, resolving an issue of the targeting of air defense elements between ground elements and tactical air might be addressed during a CPX. Such a CPX would involve measurements of the time it takes for an assembled staff to receive guidance or orders, process targeting information, plan reactions, coordinate the planning, and dispatch task orders. The JFS staff should evaluate potential CPXs against the data required to resolve test issues. CPX planning, and execution should keep in mind that coordination activities usually occur within the play of a CPX, rather than before or more preferably after it. Therefore, use of CPXs requires carefully planned data collection procedures to assure that the data required is captured in the free play environment and that data collection (by use of transparent instrumentation) does not interfere with the CPX.

Field Tests and Exercises

Field tests and exercises are generally large-scale activities conducted to obtain or validate data involving system performance under operational or near-operational conditions. They will range from one-on-one to many-on-many situations where data are required from many different systems interacting simultaneously under operational or real-world conditions including man-in-the-loop decisions that impact the systems' performance or the outcome of the interactions. Field tests and exercises are usually the most complex and expensive that a JT&E will conduct and, because of their size and expense,

will require extensive planning and coordination efforts.

The JFS should examine the Joint Staff Five Year Exercise Schedule and Service field test and exercise plans to identify opportunities to use scheduled field test and exercises as JT&E test vehicles. Criteria for identifying these test vehicles should include test schedule, scenario, location, forces (red and blue), systems, primary objectives, magnitude, and cost. Early coordination with Joint Staff and Service field test and exercise planners is necessary for the development of a credible JT&E schedule.

There are two basic types of JT&E field tests, *piggybacked* and *dedicated*. *Piggybacking* refers to methods for collecting JT&E-relevant data during already established Service or Joint tests or exercises. This is distinct from a *dedicated* test, which would be a test or exercise designed and controlled by the JT&E for the sole purpose of answering the program issues. The costs and benefits of these two approaches must be weighed in relation to specific test goals and resources. Complete piggybacking may provide the lowest cost and data gathered under the most realistic operational conditions. However, the inability to control procedures and test variables and the inability to iterate or repeat test events may obviate these apparent advantages.

In actuality, there is a more desirable compromise between these extremes. That is, conducting JT&E testing in conjunction with a field test or exercise during a dedicated "window." During this window, test resources are turned over to the control of the JT&E and test scenarios and variables may be modified to meet test objectives. This method has proven to

be an excellent compromise between the higher costs of dedicated tests and the need to exercise adequate control. The JT&E may be able to offer the test or exercise sponsors an incentive for this arrangement by providing assets (manpower equipment and test results) that will benefit the exercise or lower overall costs.

If the JT&E only needs to participate during part of a test or exercise, or is going to implement testing during a dedicated window, then a decision will have to be made between the JFS and the sponsoring agency as to the best time to conduct JT&E test activities. Piggybacking on

the front of the exercise has the advantage of having fresher troops and the greater possibility of obtaining additional time if needed. However, training exercises may start with a great deal of confusion and equipment problems as well as less trained participants. Starting too late in the exercise runs the risk of tired or poorly motivated participants who are less than willing to stay late to obtain test data. Choosing a time near the middle of the test or exercise may be the best bet, sometime after things are expected to be running smoothly and leaving enough time for additional testing if required.

ANNEX G

DESA SUPPORT

A. INTRODUCTION

DDT&E is responsible to D,T,SE&E for the overall management and oversight of the JT&E program. This handbook makes frequent reference to capabilities that are available to support the JFS. This annex lists the specific DESA capabilities that may be available. Support will be obtained through the OSD JT&E Coordinator.

B. SPECIFIC RESPONSIBILITIES

- Serves on the TAB.
- Coordinates disposition of JT&E resources/assets. Provides life-cycle management of OSD resources procured by or used for JT&E programs.
- As requested by the JT&E, provides technical and administrative management services to JT&E activities, including staffing and financial management assistance, communications and computer management, contract management, and security and environmental consulting.
- As requested by DDT&E, provides an Independent Verification and Validation (IV&V) of the technical and operational aspects of the JT&E and conducts data analysis and reporting.

C. FUNCTIONAL SUPPORT CAPABILITIES

Although not inclusive, the following support capabilities can be made available to support JFS activities. The JTD should contact

the JT&E POC for information relative to obtaining this support. If support is required, the FSD should initiate a Program Identification Document (PID) or MOA with DESA to formally establish the requirement.

Logistics Support

DESA is the custodian of Government investments in facilities, threat assets, simulators, instrumentation, test equipment, data processing equipment, and other peripherals that have been purchased by OSD with JT&E funds and which may be available for JT&E support. DESA capabilities include maintenance, storage, configuration management and control, warehousing, spares support, inventory control, transportation, calibration, O&M, equipment training, and expertise in logistics support in general.

Environmental Support

Support in this area can cover the spectrum from examination of operational impacts of testing on ranges to assistance in planning a test activity to ensure compliance with NEPA standards and requirements. This assistance can be particularly beneficial when conducting cost/benefit tradeoffs and identifying long lead items associated with Environmental Assessments (EA) and Environmental Impact Statements (EIS). DESA maintains an extensive listing of environmental directives and regulations and can provide assistance in terms of which should be reviewed for applicability. Additionally, DESA can assist in the

identification and acquisition of instrumentation and display systems that may be required for the environmental control of test activities.

Security Support

Personnel are available with experience and expertise in all aspects of security to include SSO, SCI, SCG, OPSEC, COMSEC, etc. DESA support could include assistance in the development of procedures to guarantee the security of systems, equipment, plans, operations, data, and reports; obtaining special security billets and clearances for personnel; the use of SCIF capabilities; the development of Security Classification Guides; the establishment of interfaces with compartmented projects; and periodic reviews of security procedures.

Contracting and Procurement Support

The DESA Director is head of a DoD warranted contracting activity and the expertise associated with this service is available to the JFS. This expertise includes the development and administration of contracts to support JFS activities, the identification of unique resource requirements, and the correlation of support requirements with responsible agencies to assure that the required resources will be available to support planned test activities.

DESA has existing contracts with defense contractors having personnel with extensive JT&E experience. These contracts are available for use by a JFS and a specific subtask can be quickly developed to obtain the technical support that may be required. If contracting support is required, the FSD will need to appoint a Contracting Officers Technical Representative

(COTR) from the JFS staff who will be responsible for providing technical guidance to the contractor and providing technical inputs on contractor performance to the Contracting Officer. In addition to providing information on and access to contractors having JT&E experience and assistance relative to contractual matters, DESA can provide COTR training for JFS personnel.

Technical Support

DESA can provide ad hoc technical support that includes commenting on or contributing to the development of PTDs and any of their annexes. Many DESA personnel have extensive backgrounds in T&E and work with and support on-going JFS and JTF efforts. Defense contractors currently under contract to DESA also have personnel with JT&E experience, to include past JTF Directors, Service Deputies, Chief of Staffs, Directors of Operations, and Directors of Operations Analysis. Technical support is basically available in the following areas:

- Program level guidance, assistance, and advice in the development of JFS documentation.
- Reviews of concepts and plans developed by the JFS and defense contractors operating in support of the JFS.
- Analysis, engineering, and T&E expertise.
- Information and advice on databases and models that might be applicable to the JFS effort.
- Information and advice on range equipment, test ranges, and facilities.
- Information and advice on the use of threat systems.

- Information and advice on test instrumentation systems and communications capabilities, costs, and availability.

Personnel Support

DESA cannot themselves provide personnel on a permanent or extended basis to a JFS. However, technical assistance as described in the previous paragraph can be made available on an occasional basis. Additionally, DESA can assist the JFS in developing and coordinating manpower requirements with the Services and the Civil Service in requisitioning such manpower. DESA can also assist in providing contractual support from their pool of Government contractors.

Accounting and Finance Support

Accounting and finance expertise is available and can be provided. DESA personnel are familiar with the accounting and finance procedures and peculiarities of all the Services and can be helpful to the JFS in establishing liaisons with the respective Service finance centers. DESA can also provide advice on Service procedures and periodic reviews of JFS fiscal situations and reports to assure their accuracy. However, dedicated DESA finance and accounting personnel are not available to any individual JFS or JT&E.

ANNEX H

TEST RANGES AND FACILITIES

A. INTRODUCTION

The JT&E program schedule is based on early JFS coordination with OSD, Joint Staff, and the Services relative to the use of test ranges or facilities. The JFS must be aware of and consider the coordination process that the JTF must undertake to formalize the use of test ranges and facilities that are identified in the APA.

The JTF must formalize the requirement for use of these ranges/facilities with the range/facility managers. The coordination for use of a test range or facility should be in the form of a Program Introduction Document (PID). Although range and facility use is included in the Consolidated Resource Estimate (CRE), the range/facility manager will take no action on this requirement until a PID is received. PIDs are completed using the instructions in *Universal Documentation System (UDS) Document 501-79* and the supporting agency instructions. The range/facility manager will provide the JTF with a *statement of capability* as acceptance of responsibilities as outlined in the PID.

The PID should be based on a comprehensive survey of the test range or facility. The survey data and information will form the basis for detailed test planning and decision making. During the field portion of the survey, the survey team should focus on technical, operational, and logistic considerations required for planning the support necessary to execute the planned test activity or event. Circumstances may be encountered that require follow-on visits to investigate or evaluate

potential problem areas. The survey team should take the necessary time to do the job right.

The survey team should review the current versions of the following documentation prior to beginning the survey:

- *DoD Directive 3200.11-D Major Range and Test Facility Base Summary of Capabilities.*
- *Report on Range Utilization and Improvement Plans.*
- *USAF Armament Division Technical Facilities Manual, Volumes I, II, and III.*
- *US Army Test Facilities Register, Volumes I and II.*
- *Test and Range Facilities Catalog – Naval Sea Systems Command*
- *Naval Test Facilities Data Base (access through Technet)*

The range or facility survey should acquire or develop data and information on the following test range or facility capabilities and should conclude with positive and well documented recommendations on which planners and managers can make decisions or develop plans and procedures.

B. TEST RANGE OR FACILITY

1. Describe the range or facility in detail. Provide the geographical location, topography, noncontiguous aspects, and climatic conditions associated with the range or facility.
2. Provide the size and dimensions of the range or facility and identify any restricted land or

air space usage requirements. Include maps and technical documentation when appropriate.

3. Address the range or facility operating schedule and availability on a yearly basis, closure conditions, EMI/EMC impacts, and proximity of the area to on and off range military and commercial flight patterns.
4. Address the availability of floor space in existing structures that can be used by JTF personnel.
5. Identify the range or facility management hierarchy and directives for management, conduct, and support of test activities.

- Commissary.
- Concessions (barber shop, laundry, movies, etc.).
- Dining Facilities.
- Medical Services.
- POL (to include delivery to test sites).
- Reference Library (technical).
- Religious Services.
- Secure Storage.
- Supply Support.
- Transportation (passenger and freight).
- Security (guard service).

C. LOGISTICS

1. Test range or facility accessibility.
 - Air- Provide name and location of airfields, military and commercial. Identify servicing airlines.
 - Roads- Identify intra-range or facility roads to primary highway and commercial highway transportation facilities.
 - Water - Identify port or access waterways, distances to the range or facility, restrictions to use, and suitability for test activity or event use.
2. Nearest Military Establishment. Identify the nearest military establishment that can provide logistic and supply support. Establish POC and determine the administrative vehicle needed to acquire service support to include:
 - Billets for Officers, enlisted and contractors.
 - Base Exchange.
 - Clothing Sales.

D. CIVIL ENGINEERING

1. Determine the level of support that civil engineers are able to provide and the response times associated with the support.
2. Determine the type of electrical service that is available at test sites to include:
 - Prime power or generator power.
 - Capacity of power plant to include voltage, frequency, and phasing. Determine size of power plant and availability of spare service.
 - Determine if back up power is available and is start up manual or automatic.
 - Determine if grounding and lightning protection is available for range or facility systems.

E. SECURITY

Determine the existence of test range or facility security plans and check the following:

- Area security provisions and assigned priorities for their protection.
- Control measures and established restrictions to access and movement into

critical areas (personnel, vehicles, and materials).

- Determine aids to security, such as protective barriers, signs, gates, protective lighting systems, communications, and the availability of security forces.
- Determine if contingency plans are responsive to emergency situations.
- Determine the requirements for passing clearance data on personnel for range or facility access.

F. SAFETY

Establish contact with the range or facility safety officer and obtain copies of range or facility safety directives, brochures, POCs, and key telephone numbers. Also obtain information on the following:

- Range or facility speed limits.
- Use of rental cars.
- Identify the meanings of different colored warning lights.
- Identify precautions required at remote test sites.
- Identify criteria for evacuation of range or facilities.
- Determine locations of first aid stations.
- Identify restricted or hazardous operations areas.
- Identify methods of notification for range or facility closure.

G. RANGE OR FACILITY SYSTEMS AND EQUIPMENT

Range and facility systems and equipment are normally identified in master planning

documents which are afforded an appropriate level of classification. The JTF survey team should obtain copies of these documents, if feasible. If not, collect the data listed in the following paragraphs. Identify the equipment or systems, determine the quantity on hand, and obtain their authorized frequencies, operational locations, and geographical coordinates. Some of the frequencies may be classified.

- Communications. Determine if the required frequency spectrum is authorized/used.
- Targets.
- Range or Facility Instrumentation. Identify the data source mechanization, the end product, and fidelity of the available data sources. Determine the data formats and elements for each source product. Determine if the systems are certified prior to the start of missions and if the system modifications are controlled.
 - (1) Scoring Systems.
 - (2) Acquisition Systems.
 - (3) Threat Systems.

H. RANGE OR FACILITY SUPPORT SYSTEMS

1. Range Timing System.
 - Identify the time code format and timing technique used.
 - Determine if system is available to all test sites.
 - Determine compatibility with instrumentation requirements.
 - Determine availability of backup source.
 - Determine time-synch capabilities.

- 2. Integrated Air Defense Systems.
 - Determine if systems are available.
 - Determine if systems are automatic, semi-automatic, or manual.
 - Determine system hardware configurations.

- 3. Intra-base Radios.
 - Determine nets that are available and their respective functions.
 - Determine types of equipment and authorized frequencies.
 - Determine the availability of radios for white communications use.

- 4. Range or Facility Calibration Systems.
 - Define system configuration/network.
 - Determine if systems are integrated with timing system.
 - Determine if calibration models and databases of historical information are available.

- 5. Automatic Data Processing.
 - Define the computer systems and the companion data collection systems.
 - Describe the computer hardware interface with the data sources.
 - Determine if results of test are provided on a real-time basis.
 - Identify and obtain copies of computer products.

I. DISPLAY SYSTEMS

- 1. Identify the type, location, and function of display systems.
- 2. Identify computer programs in the systems, and the communications interfaces that accept and feed the raw data to the computers.
- 3. Determine if the display systems are on a real-time or near real-time basis. Determine if systems have capability to produce hard copies of displayed data.

J. FINANCIAL

Identify the point of contact and the established arrangements for user reimbursement of costs associated with the use of the range or facility and options for cost sharing of improvements that might be required.

K. SUMMARY

Provide an overall assessment of the range or facility, the anticipated support, and any details that might contribute to test planning and execution.

L. RECOMMENDATIONS

Be specific. If the survey teams discover problems that could seriously impact test execution, the report should so state and document the finding or identify the specific limitations that use of the range or facility would have on test execution.

ANNEX I

CONSOLIDATED RESOURCE ESTIMATE (CRE) OUTLINE

The CRE is prepared to consolidate JT&E resource requirements into a single document. The CRE documents JFS projections of JT&E resource requirements and will subsequently be used as the basis for the initiation of Service resource requests (TRPs and OTPs). The following CRE format is extracted from the Operational Test Agencies' (OTA) MOA for MOT&Es and JT&Es.

1. Title
2. References: Nominating Organization, Charter, Dates
3. Purpose of JT&E
4. Scope and Tactical Relationships
5. Test Concepts or Issues/Objectives
6. Lead/Participating Services
7. Services POC Lists
8. Proposed Test Installation Locations
9. Test Activity Dates
10. Test Directorate Personnel/Equipment
 - a. Test Staff
 - 1) Data Management
 - 2) Logistical
 - 3) Administrative
 - 4) Test Operations
 - 5) Controllers
 - 6) Data Collectors
 - 7) Software Evaluators
 - b. Aviation Support
- c. Signal/Communications
- d. Miscellaneous Equipment
- e. Training Requirements
11. Player Participants Personnel/Equipment
 - a. Blue Force
 - 1) Ground Players/Units
 - 2) Aviation Players/Units
 - 3) Ground Players Equipment
 - 4) Aircraft Hours/Types
 - 5) Training Requirements
 - b. Red Force
 - 1) Ground Players/Units
 - 2) Aviation Players/Units
 - 3) Ground Players Equipment
 - 4) Aircraft Hours/Types
 - 5) Training Requirements
12. Installation Support
13. Test Targets
14. Instrumentation
15. ADP
16. Ammunition/Missiles
17. POL
18. Contractor Support
19. Funding Estimates
20. Milestones
21. Test Range Support
22. Computer Simulators/Models/Test Beds
23. Threat Systems/Surrogates/SIMS
24. Foreign Material to Replicate the Threat
25. Accreditation Support

ANNEX J

TEST PROGRAM COST/BUDGET MATRIX

Joint Feasibility Studies are required to develop a Consolidated Resource Estimate (CRE) and a by-year budget projection if recommending the chartering of a Joint Test and Evaluation (JT&E). The attached **test program cost/budget matrix** illustrates how these resource requirements can be translated into funding requirements. The matrix attempts to capture the primary JT&E activities that have associated costs, the type of activities that need to be examined, and methods that could be used to estimate the dollars required to support these particular activities. Once the costs have been determined they are aggregated to arrive at the CRE and projected yearly budget estimate. The matrix is generic in nature and will need to be adjusted to fit the specific requirements of each proposed JT&E. Some JT&Es will have unique testing/activity requirements not reflected by the topics in the matrix and others will have no need for some of the topics listed.

In general, things to consider in filling out the matrix for a particular JT&E include the following:

- Aircraft/ship/platform by type/sorties.
- Weapon(s) by type.
- Communication equipment by type and mission (operational and test support).
- Target(s).
- Characterization requirements.
- Instrumentation (beacon, pod, TSPI, GPS, TACTS, ACMI, GRDCUS, VTR, War wagons, etc.).
- Meteorological requirements.
- Modeling/simulations.
- Data sources/devices (9 track, floppy disks, Bernoulli, bar code labels, etc.).
- Data collectors (government, civilian, military, contractors).
- Operational equipment.
- Test unique equipment (equipment consumed during the JT&E or no longer required after the JT&E).

PRIMARY ACTIVITIES	COST CATEGORY	METHOD/EXAMPLE
DIRECT TEST COSTS		
TEST PREPARATION Note: Preparation costs must be prepared for each test site/event.	Environmental Impact Study	
	Safety Plan	
	Train/Coordinate Test Instrumentation Operators	<ul style="list-style-type: none"> - number of operators - travel to training site - per diem during travel and TDY - rental cars
	Test Communication Network	<ul style="list-style-type: none"> - packaging and shipping - communication network setup - travel to test site - per diem during travel and TDY - rental cars
TEST ASSETS	Test Specific Materials Note: These are materials prepared for each test site/event and be will be unique for each JTF. Examples are from JCCD.	<ul style="list-style-type: none"> - smoke generators - remote controls - woodland, snow, desert camouflage screens/supports - runway false operating surface - decoy buildings and piers - radar corner reflectors - photo image canvas - expendables (e.g. fog oil, tonedown paint, RAM/IR coatings, packaging & shipping costs)
	Instrumentation	<ul style="list-style-type: none"> - rental/lease of instruments - calibration costs - packaging and shipping - operator costs if not included elsewhere (e.g. pay & allowances, travel, per diem, rental car)
	Projected TDY Costs	<ul style="list-style-type: none"> - transportation/travel (for each site/person to/from each home station) - per diem (per person per day for number of days) - rental car cost (number of cars, projected days, average cost per day)
	Test-Related Contract Support	<ul style="list-style-type: none"> - JTF on-site support - test site/event support

PRIMARY ACTIVITIES	COST CATEGORY	METHOD/EXAMPLE
TEST ASSETS (Cont)	Range Costs	<ul style="list-style-type: none"> - range-owned instrumentation - range control/data processing - range communication costs - range utilization - range safety/fire/medical emergency crew
	Pretest Modeling Costs	<ul style="list-style-type: none"> - development of input parameters and characteristics to run the model - model modification cost - projected cost to perform modeling
	Dry Runs	<ul style="list-style-type: none"> - execution of unique trials
TEST DATA PROCESSING COSTS		
DATA COMPILATION Note: Prepared for each test site/activity. It includes the physical handling of the data, input, documenting calibration procedures and instrumentation characteristics, obtaining data samples, etc.)	Manpower Required (man days/months)	<ul style="list-style-type: none"> - targets - participants (e.g. aircraft, tanks, ships, etc.) - meteorological
	Test Range Data Retrieval Reduction	
DATA REDUCTION AND RE-COMPILATION Note: Prepared for each test site/event. It includes data reduction and re-compilation processing of data, checking range to target data, validating calibrations, assimilating data from similar instruments at different sites/events	Manpower Required (man days/months)	<ul style="list-style-type: none"> - per instrumentation requirement
DATA ANALYSIS Note: Prepared for each test site/activity.	Manpower Required (man days/months)	<ul style="list-style-type: none"> - per instrumentation or test/activity requirement

PRIMARY ACTIVITIES	COST CATEGORY	METHOD/EXAMPLE
DATA COMPARISON Note: Multi-treatment/cross-platform comparisons	Manpower Required (man days/months)	
DATA ARCHIVE PREPARATION Note: Prepared for each test site/activity.	Manpower Required (man days/months)	
COMPARE/ANALYZE PREDICTED TO ACTUAL TEST RESULTS	Manpower Required (man days/months)	
ANALYZE COMPARATIVE TEST RESULTS Note: Multi-tests/activities.	Manpower Required (man days/months)	
TEST-UNIQUE COMPUTER HARDWARE/SOFTWARE COSTS (AFTER USE ITEMS ARE EITHER CONSUMED OR ARE NO LONGER REQUIRED)		
TEST-UNIQUE COMPUTER HARDWARE	Workstations	<ul style="list-style-type: none"> - type(s) of station - cost/numbers
	High Resolution Window Terminals	<ul style="list-style-type: none"> - type(s) of terminals - cost/numbers
	Portable Computer Hardware	<ul style="list-style-type: none"> - type(s) of computers - cost/numbers
	Server	<ul style="list-style-type: none"> - type(s) of server - cost/numbers
TEST-UNIQUE STORAGE DEVICES	Tape Drives	<ul style="list-style-type: none"> - type(s) of tape drives - cost/numbers
	Disk Drives	<ul style="list-style-type: none"> - type(s) of disk drives - cost/numbers
TEST-UNIQUE OTHER HARDWARE	Laser Printers	<ul style="list-style-type: none"> - type(s) of laser printers - cost/numbers
	Color Printers	<ul style="list-style-type: none"> - type(s) of color printers - cost/numbers
	Dot Matrix Printers	<ul style="list-style-type: none"> - type(s) of dot matrix printers - cost/number
	Other Printers	<ul style="list-style-type: none"> - type(s) of other printers - cost/number

PRIMARY ACTIVITIES	COST CATEGORY	METHOD/EXAMPLE
TEST-UNIQUE COMPUTER MAINTENANCE	Network/Hardware Management	- manpower required (man months)
	Hardware Maintenance	
TEST-UNIQUE COMMERCIAL SOFTWARE	Licensed Commercial Software	- type of software - cost/numbers of copies
DATABASE-RELATED COMPUTER HARDWARE/SOFTWARE COSTS		
DATABASE-RELATED COMPUTER HARDWARE	Workstations	- type of workstations - cost/number of workstations
	Computer Terminals	- type of terminals - cost/number of terminals
	Server(s)	- type of servers - cost/number of servers
DATABASE-RELATED STORAGE DEVICES	Tape Drive(s)	- type of tape drives - cost/number of tape drives
	Optical Disk(s)	- type of optical disks - cost/number of optical disks
	Disk Drive(s)	- type of disk drives - cost/number of disk drives
DATABASE-RELATED OTHER HARDWARE	Laser Printers	- type(s) of laser printers - cost/number of laser printers
	Color Printers	- type(s) of color printers - cost/number of color printers
	Dot Matrix Printers	- type(s) of dot matrix printers - cost/number of dot matrix printers
DATABASE-RELATED MAINTENANCE	Hardware Maintenance	
DATABASE-RELATED SOFTWARE	Licensed Software	- type of software - cost/number of copies
	Purchased Software	- type of software - cost/number of copies
	Developed Software	- type of software - projected cost/manpower
	Other Software	

PRIMARY ACTIVITIES	COST CATEGORY	METHOD/EXAMPLE
OTHER CONTRACT SUPPORT COSTS		
TEST DESIGN SUPPORT	Manpower	- cost per man day/month/year
TEST PLANNING SUPPORT	Manpower	- cost per man day/month/year
REPORT PREPARATION	Manpower	- cost per man day/month/year
DEVELOP/REFINE MODEL CALIBRATION TOOLS	Manpower	- cost per man day/month/year
OTHER COSTS		
NON-TEST EVENT RELATED TRAVEL	Conferences/Technical Interchanges	- number of trips - average cost (average length, max. per diem, rental car, average transportation cost)
	Administrative Travel (IPR, TAB, GOSC, etc.)	- number of trips - average cost (average length, max. per diem, rental car, average transportation cost)
LEAD AND PARTICIPATING SERVICE COSTS (NON-OSD)		
	Civilian Pay	
	Office Facilities	
	Vehicle Rental	
	TDY and Per Diem (non-JTF)	
	Base Support (ISSA)	
	Platforms and Equipment	- Flying Hours - POL - Munitions
	Furniture	
	Non-test Specific Supplies and Equipment	

ANNEX K

ENVIRONMENTAL CONCERNS

A. INTRODUCTION

JFS planning for the execution of the JT&E must consider the environmental effects of test activities in the development of the test concept and APA. Failure to consider environmental compliance requirements could result in negative consequences to include rejection of JFS recommendations, test activity cancellation, or unacceptable schedule delays after the JTF is chartered. Avoiding these consequences requires that the JFS understand and develop an appreciation of the National Environmental Policy Act (NEPA) and associated DoD Directives.

It is important when considering a JT&E test activity to be aware that DoD is the Federal leader in agency environmental compliance and protection. There are more than 40 Federal environmental statutes which could affect contemplated JT&E test activities. State and local environmental laws are derived from these Federal regulations and are usually more restrictive.

This annex provides information on environmental issues and procedures that might apply to the JT&E. If test activities under consideration are to be conducted on an established DoD facility or major range test facility, coordination with local environmental personnel and compliance with established local procedures should be adequate.

Most military or Government test facilities have their own environmental departments that

have completed many environmental impact studies and subsequent statements based on previous test activities. These environmental impact statements can be used provided the proposed JT&E test activity has similar assets and scenarios of past test activities.

If the JT&E is considering test activities on non-DoD lands or test activities that will require the transport of equipment or materials over public transportation systems, the JFS must become familiar with and consider the possible impact of environmental directives and regulations for the areas of interest. These directives and regulations can be obtained by contacting the Environmental Protection Agency (EPA) Regional Offices. The EPA can also provide assistance relative to state and local regulations for the area of interest.

DESA can provide a wide range of help to the FSD to ensure that environmental issues are properly considered. Specific help includes legal counseling, access to environmental planning tools, databases, and expertise and advice on obtaining special instrumentation that might be required to monitor environmental compliance.

B. TEST ACTIVITY CONSIDERATIONS

The environmental challenge for any test is the identification of proposed test activities that might produce adverse biological, ecological, or socioeconomic environments. Some test activities will have no impact on these areas. In others, the projected impact might range from some to

severe. In either case, the planned test activities must comply with environmental laws and regulations. Two basic tenants of these laws and regulations are:

- Test activity procedures must ensure that environmental information is available to decision makers and citizens.
- Test activity plans must consider reasonable alternatives to avoid or minimize environmental adverse effects.

Environmental regulations are classified as either procedural or substantive. The NEPA requires all Federal agencies to consider environmental impacts during the decision making process regarding proposed test activities. Depending on whether a proposed test activity could significantly affect the environment, one of these levels of analysis is required: (1) Categorical Exclusions (CATEX), (2) Environmental Assessments (EA), or (3) Environmental Impact Statements (EIS). The JFS should include estimates for the time and expense that might be required for these environmental considerations for each of the proposed test activities.

Categorical Exclusions (CATEX)

Categorical Exclusions are those test activities that do not normally have a significant individual or cumulative effect on the environment or have previously been found to have no such effect as a result of procedures adopted by the DoD. Categorical Exclusion activities are listed in *DoD Directive 6050.1* and they do not require an EA or EIS.

Environmental Assessments (EA)

An EA is an analysis of the potential environmental impact of a proposed test activity. An EA may be required when the JFS can not determine beforehand whether the test activity under consideration will affect the environment or will be controversial with respect to environmental effects. If required, the EA will either conclude that the test activity will not significantly effect the environment, thus resulting in the preparation of a Finding of No Significant Impact (FONSI) or will conclude that the test activity could have a significant impact.

Environmental Impact Statements (EIS)

The JFS should identify test activities that could involve potential environmental impacts. The environmental impact of proposed test activities should be considered in the selection of the test method and the feasibility of conducting the test activities at specific locations. If environmental impact is anticipated and there is no alternative test method, the JTF may be required to conduct an EIS. The following are characteristics of an EIS:

- An EIS is a formal consideration of environmental consequences. It addresses the nature of the action and its potential impact on the environment. The EIS must address all measures that can and will be taken to minimize these impacts and alternatives to the proposed test activity, to include the consequences of not doing the entire test activity.
- An EIS is both complex and lengthy. It is possible to have the EIS prepared by a contractor.

- The length and cost of an EIS can be extensive and may require several many years of specialized analytical effort to complete. Thus, the requirement for the identification of a potential EIS requirement for proposed JT&E test activities cannot be overemphasized.

C. ENVIRONMENTAL IMPACT CONSIDERATIONS

The JFS should as a minimum include the following in their consideration of environmental impacts:

- Determine test activity scenario, location, assets, environmental concerns, and considerations.
- Determine if test facility has environmental impact statements that would be applicable to the proposed test activity. The test facility managers will know what requirements are fulfilled or need further study.
- Determine what environmental impact actions are ongoing.
- If environmental actions will be required, estimate associated cost and time to accomplish.
- Consider other test activity options.

D. TEST EVENT CONSIDERATIONS

The following is a list of some test and evaluation considerations that need to be addressed by the JFS:

- Weapon Firing (noise and air emissions).
- System maintenance (waste solvents and oils).

- Vehicle operation (noise, terrain impacts, and air emissions).
- Contamination of land resources and unexplored ordinance.
- Accidents involving hazardous materials.
- Test site cleanup.
- Land use management.
- Wildlife protection.
- Archaeological and historical resources.

E. PUBLIC INVOLVEMENT

Public participation in preparing EAs and EISs is a reality that the JFS will have to consider. Therefore, should a test activity involve the potential for a significant environmental impact, the JFS should consider the requirement that the JTF will have to establish appropriate communications with local authorities and interested parties. In determining the extent to which public participation could be required, the JFS should consider the following factors:

- The magnitude of the environmental considerations associate with the proposed test activity.
- The extent of anticipated public interest.
- Relevant questions of national security and classification.

F. CLASSIFIED TEST ACTIVITIES

Classified tests must comply with the same environmental laws, regulations, and directives as unclassified tests. EISs and EAs will have to be prepared, safeguarded, and disseminated according to the requirements applicable to all classified information. When feasible, the documents should be organized in such a manner that classified portions are included as

appendices, so that the unclassified portions may be made available to the public.

A classified EA/EIS serves the same informed decision making purpose as do the unclassified versions. Even though the classified EA/EIS does not undergo public review and comment, it will be part of the information package for each JT&E activity. The content of a classified EA/EIS must, therefore, meet the same content requirement that is applicable to a published unclassified version.

G. JTF FOREIGN TEST ACTIVITIES

The environmental situation of a joint test conducted outside the territories of the United States will depend on the requirements and

standards set by the host and Status of Forces Agreement (SOFA). Thus, if a test activity is considered at a non-U.S. location, the JFS must be familiar with the specific regulations that apply to testing in the host country and the specific locale within that country. All U.S. facilities located outside the territories of the United States are required to conduct their test activities in an environmentally safe manner and in compliance with both host country and U.S. military regulations relating to environmental, natural resource protection, and occupational health and safety. The two major U.S. directives that apply to or specifically address testing issues are:

- *DoD Directive 4120.14.*
- *EO 12114: Environmental Effects Abroad of Major Federal Actions.*

ANNEX L

SECURITY CLASSIFICATION GUIDE

If the JFS involves the development of classified material, the JFS should consider the requirement to develop a Security Classification Guide (SCG). The following is an example of

an SCG format developed by a recent JTF that could be tailored to the specific requirements of the JFS.

A. COVER

Title:

Issued By:

Approved By:

Date:

Action Officer:

Distribution Notice: This document covers the operational use of military systems and hardware. Distribution restricted to DoD and DoD contractors. Further dissemination only as directed by JXXX/JFSD, XX Road, Any Town, USA.

B. SECTION I

GENERAL INSTRUCTIONS

classification, regarding, or declassification of information and material originated by the JXXX/JFS.

1. PURPOSE. To provide instructions and guidance on the classification of information developed by the JXXX/JFS.

2. AUTHORITY

- a. This guide is issued under the provisions of Executive Order 12356; DoD 5200.1R, Information Security Program Regulation; DoD 5220.22M; and DoD 5220.22R.
- b. This guide constitutes the authority for, and may be cited as the basis for,

3. OFFICE OF PRIMARY RESPONSIBILITY (OPR). All inquiries concerning the content and interpretation of this guide should be addressed to JXXX/JFS, XX Road, Any Town, USA XXXXX-XXXX.

4. CLASSIFICATION RECOMMENDATIONS. Recommended changes will be completely documented and justified. Recommendations should be made through appropriate channels to the OPR.

Pending final decision, contested classified information shall be handled and protected at the higher classification. All users are encouraged to assist in improving and maintaining the currency and adequacy of this guide.

Because of interface relationships of program material, unclassified items of information may become classified or sensitive when combined into a single document. Therefore, care must be taken prior to the release of any related information, even though it is unclassified. Further, the release of such information should be based upon the recipient's strict need-to-know.

5. APPLICATION, REPRODUCTION, AND DISSEMINATION. This guide is intended specifically for the use and guidance of individuals with a need-to-know

requirement for information contained herein. Reproduction and dissemination will be at the discretion of the FSD.

6. PUBLIC RELEASE. The fact that certain information is shown to be unclassified does not authorize public release. Public release of unclassified information must be approved by the FSD.

7. FOREIGN DISCLOSURE. Release of program information or hardware/software is not authorized to any foreign entity or foreign national without prior approval by the JXXX/FSD. All proposed releases of program information to any foreign government shall be forwarded to the OPR for review and further processing action.

8. PROGRAM DEFINITIONS. The following is a list of abbreviations and designations used throughout this guide:

a. C	Confidential Classification Level
b. COMSEC	Communications Security
c. DoD	Department of Defense
d. FOUO	For Official Use Only
e. FSD	Feasibility Study Director
f. JXXX	Joint XXX Feasibility Study
g. JFS	Joint Feasibility Study
h. JTD	Joint Test Director
i. JTF	Joint Test Force
j. JT&E	Joint Test & Evaluation
k. MACOM	Major Command
l. NOFORN	Not Releasable to Foreign Nationals
m. OADR	Originating Agency Determination Required

n. OPR	Office of Primary Responsibility
o. OPSEC	Operations Security
p. R&D	Research and Development
q. RCS	Radar Cross Section
r. RDT&E	Research, Development, Test & Evaluation
s. S	Secret Classification Level
t. SAM	Surface-to-Air Missiles
u. SCG	Security Classification Guide
v. T&E	Test and Evaluation
w. TS	Top Secret Classification Level
x. TSPI	Time Space Positioning Information
y. U	Unclassified
z. WNINTEL	Warning Sensitive Intelligence Sources and Methods Involved

C. SECTION II

OVERALL EFFORT

9. GOALS, MISSION, & PURPOSE. To provide instructions and guidance for the security classification of information and material originated by the JXXX/JFS.

- a. The purpose of the JXXX/JFS is to determine the need for and feasibility of a joint test that is to (as appropriate)
- b. The JXXX/JFS Security Classification Guide (SCG) is designed to protect information related to (e.g., U.S. missiles, manned aircraft systems, sensor performance and vulnerabilities, intelligence assets and All-Source Imagery information, tactics and weapons employment, CCD treatments, etc.), data

collected or derived from other sources for JXXX use and various other aspects of the test procedures.

10. END ITEM. The end item(s) of this effort include a Joint Feasibility Study Final Report and an Analysis Plan for Assessment.

The JFS final report and APA will normally be unclassified unless the subject matter is otherwise classified or so designated by the authority or agency supplying the proposed equipment and/or techniques to be tested. Test data and results which indicate a capability, vulnerability, weaknesses or which would compromise system survivability will normally be classified Secret. Actual use of equipment or concepts to be tested during exercises, alerts, and war will be classified in

accordance with the guidance of the theater, area of operations, or base commanders.

Source classification guidance must be consulted when information and hardware

which is classified by other agencies are utilized. The following subparagraphs contain detailed classification guidance.

<u>TOPIC</u>	<u>CLASS</u>	<u>DECLASS</u>	<u>COMMENT</u>
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11. GENERAL:

a. Information revealing the existence of general (XXX) policy, doctrine, tactics, material, techniques, and training program	U		
b. Acknowledgment that new (XXX) capabilities are continually being developed	U		
c. The identity of organizational (XXX) planners	U		Protect as FOUO
d. Information that reveals that there is a policy of employing peacetime (XXX) to support security operations	U		Note 2
e. Information that reveals that there is a policy of employing (XXX) to enhance defense of forces and/or support/conduct combat operations	U		Protect as FOUO
f. Information that reveals a policy concerning the planning and conduct of combined (XXX) operations and exercises	U		Notes 2 & 3

g. Generic tactics and techniques such as feints, diversions, ruses, demonstrations, displays, electronic deceptions, and communications	U		
h. Effectiveness of actual tactics or techniques, if known, that are not influenced by foreign knowledge	U		
i. Actual tactics or techniques which, if known, would aid an adversary in the detection of tactical (XXX) activity or facilitate development of countermeasures	S	OADR	Note 3
j. Actual tactics or techniques which, if disclosed, might reveal intelligence sources or collection capabilities	See Comments		Notes 4 & 9
k. Information detailing the comprehensive capabilities and goals (current and projected) of a service, MACOM, base or unit	S	OADR	
l. Information identifying vulnerabilities or deficiencies in tactical (XXX) operational plans, conceptual plans, operations, capabilities, tactics, training, or equipment which would negate their effect if known	S	OADR	Note 3

m. Information revealing the actual employment of (XXX) equipment and techniques when knowledge of the information would aid threat planning to negate, nullify, or counter the use of the means; or, when the existence of a classified capability would be revealed

S

OADR

Note 3

12. (XXX) EQUIPMENT AND TECHNIQUES

a. Permanent (XXX) equipment/techniques used and/or employed

b. Plans for specific use of (XXX) which are deployed only during certain stages of alert or actual combat

c. Instructions revealing how to use (XXX) equipment and techniques (unclassified unless otherwise noted)

U

OADR

U

13. TEST DATA:

a. Test plans, methodology, test data, or results that do not reveal specific vulnerabilities, capabilities, or weaknesses

b. Test plans, methodology, test data, or results that reveal specific vulnerabilities, capabilities, or weaknesses

U

OADR

c. Test philosophy & objectives			
• If capabilities, vulnerabilities or limitations are revealed	S	OADR	
• If capabilities, vulnerabilities, or limitations are not revealed	U		
d. Test results			
• If capabilities, vulnerabilities, or limitations are revealed	S	OADR	
• If capabilities, vulnerabilities, or limitations are not revealed	U		
e. Actual test dates	U		Protect as FOUO
f. Overall test schedule	U		Protect as FOUO
g. Location of test sites	U		

14. DATA ACQUISITION, REDUCTION, AND PRESENTATION:

a. Mathematical algorithms or computer software routines that are used to reduce, analyze, or present data	U	Note 6 (Information may be protected as proprietary)
b. Mathematical algorithms or computer software routines that are used to evaluate (XXX) equipment or techniques effectiveness	U	Note 6 (Information may be protected as proprietary)

c.	Remotely sensed signatures, measurements, reports, papers, software, synthetic or enhanced imagery, drawings, etc., that provide research and development results, conclusions, or recommendations that reveal an enhancement or vulnerability that could compromise the survivability or operability of a high-value asset target, facility or installation	S	OADR	Notes 7 & 8
d.	Specific conclusions and recommendations regarding (XXX) test and evaluation drawn from raw or tabulated data as described in (c) and processed data as previously described if they reveal vulnerabilities or impact on survivability	S	OADR	
e.	Reports resulting from use of classified data and/or analysis, conclusions, and recommendations	See Comments		Note 11
f.	Compiled database (in any form) of test results when capabilities, vulnerabilities, limitations, or weaknesses are revealed	S	OADR	Notes 6 & 8
g.	Compiled database (in any form) of test results when capabilities, vulnerabilities, limitations, or weaknesses are not revealed	See Comments		Note 8 (Protect as FOUO)

D. SECTION III

PERFORMANCE AND CAPABILITIES

<u>TOPIC</u>	<u>CLASS</u>	<u>DECLASS</u>	<u>COMMENT</u>
15. TEST & EVALUATION			
a. Information related to the performance and/or capabilities of specific (XXX) equipment or techniques	S	OADR	
b. Information related to countermeasures that would affect the performance and/or capabilities of (XXX) equipment or techniques	S	OADR	Note 3
c. Information regarding current or projected performance and/or capabilities of (XXX) equipment or techniques	S	OADR	
d. Design, performance and/or functional characteristics of operational (XXX) equipment	See Comments		Note 9
e. Test procedures information			
• If operational employment tactics, capabilities, or limitations are revealed	S	OADR	Note 9
• If operational employment tactics, capabilities, or limitations are not revealed	U		

16. DATA REDUCTION & PRESENTATION:

a. Test data and reports that disclose (XXX) performance	See Comments	U	Note 9
b. Test data and reports that do not disclose (XXX) performance		U	
c. Test data analysis, results, and conclusions			
• If capabilities, limitations, or vulnerabilities of a system are revealed	S	OADR	Note 3
• If capabilities, limitations, or vulnerabilities of a system are not revealed	U		
d. Flight test data/encryption codes	See Comments	U	Notes 4 & 9
e. Raw or tabulated data resulting from tests, such as uncaptioned photographs, thermographs, temperature measurements, radar cross-section measurements, etc.		U	Notes 7 & 9 (Protect as FOUO)
f. Processed data from tests, such as captioned photographs or thermographs, tabulated temperature measurements, RCS measurements, etc.	S	OADR	Notes 4 & 10
g. Mission tapes obtained from test aircraft	See Comments	U	Note 9 (See Sec. 20 a & b)

h. Raw test data tapes and logs generated by JXXX

- If results are revealed which indicate capabilities, vulnerabilities, or weaknesses S OADR
- If results are not revealed which indicate capabilities, vulnerabilities, or weaknesses U

i. Measurement parameters identified on data sets, imagery and individual target RCS tables See Comments Notes 4 & 9

j. Display of mission route or maps containing information revealing location, scale of distance U

17. (XXX) DESIGN INFORMATION:

a. If information concerning limitations, deficiencies, vulnerabilities or weaknesses that could impact on system survivability is revealed S OADR Notes 3 & 9

b. If information concerning limitations, deficiencies, vulnerabilities or weaknesses that could impact on system survivability is not revealed U

E. SECTION IV

SPECIFICATIONS

<u>TOPIC</u>	<u>CLASS</u>	<u>DECLASS</u>	<u>COMMENT</u>
18. SYSTEM AND SUB-SYSTEM SPECIFICATIONS:			
a. T&E activities and end products that reveal:			
• Specifications of (XXX) equipment or techniques that describe items but do not provide information regarding signature alteration, radar cross-sections, etc/as appropriate		U	
• Specifications of (XXX) equipment or techniques that describe items and provide information regarding signature alteration, radar cross-sections, etc./as appropriate	S	OADR	Note 9

F. SECTION V

CRITICAL ELEMENTS

<u>TOPIC</u>	<u>CLASS</u>	<u>DECLASS</u>	<u>COMMENT</u>
19. TEST & EVALUATION			
a. Activities which reveal test			

- The fact that equipment and techniques have the capability to alter or simulate signatures in any spectral band S OADR
- Those features of equipment and techniques that provide levels of signature alteration or simulation S OADR
- b. The fact that equipment and techniques cause degradation in enemy target detection and recognition capability U
- c. Quantitative data on actual degradation in detection and recognition range of target acquisition systems S OADR
- d. Conclusions regarding the current and/or projected impact on target detection and recognition capability S OADR
- e. New principles, procedures, or doctrine that reveal a break-through with significant military impact S OADR
- f. Operational concepts for implementation of CCD equipment and techniques S OADR

20. DATA ACQUISITION:

- a. Time Space Positioning Information (TSPI) See Note 9
Comments
- b. HUD systems data See Note 9
Comments

**21. AIRBORNE SENSORS
AND INTELLIGENCE
ASSETS:**

G. SECTION VI

VULNERABILITIES AND WEAKNESSES

<u>TOPIC</u>	<u>CLASS</u>	<u>DECLASS</u>	<u>COMMENT</u>
22. (XXX) EQUIPMENT & TECHNIQUES:			
a. Instructions on how to (as appropriate, i.e. operate, assemble, erect, move, or place) (XXX) equipment or when a vulnerability or weakness is indicated	S	OADR	
b. Current or projected (XXX) equipment and techniques that reveal vulnerabilities or weaknesses	S	OADR	
c. Information resulting from tests regarding current or projected (XXX) equipment or techniques, deployment concepts, or counter-countermeasures that reveal an enhancement or vulnerability	S	OADR	Note 3

23. DATA REDUCTION:

- a. Mathematical techniques and computer codes that are related to assessment of (XXX) vulnerabilities and weaknesses:

- Aid in the solution, but do not predict signatures from physical data inputs U Note 8
- Predict signatures from physical data inputs if vulnerabilities are revealed S OADR Note 9
- Include optimization routines for defining configuration shapes for low or minimal signatures S OADR

24. SUPPORT EQUIPMENT:

a. Aircraft	See Comments	Note 9
b. Ground equipment	See Comments	Note 9

H. SECTION VII

HARDWARE

<u>TOPIC</u>	<u>CLASS</u>	<u>DECLASS</u>	<u>COMMENT</u>
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25. HARDWARE:

a. Hardware nomenclature	U	
b. Federal stock number	U	
c. Serial numbers	U	
d. Model designation	U	
e. (XXX) End item(s) (as appropriate)	See Comments	Note 5
f. Support aircraft (as appropriate)	See Comments	Notes 5 & 9

g. Ground support equipment See Notes 5 & 9
(as appropriate) Comments

26. DATA PROCESSING EQUIPMENT:

a. Specification/performance characteristics equipment or instrumentation used to collect, reduce, analyze, or present data or used to evaluate (XXX)	See Comments	Notes 1, 5 &11
		(Information may be supplier proprietary)

I. SECTION VIII

ADMINISTRATIVE DATA

TOPIC CLASS DECLASS COMMENT

27. GENERAL:

a. (XXX) equipment and techniques except for those hardware and data items including signature measurements, photographs, drawings, and specifications U Note 5

b. Specialized (XXX) equipment and techniques for critical elements S OADR

c. Orders to install, erect, or place individual items of (XXX) equipment

- Pertaining to wartime measures that would indicate preparations against or for attack S OADR

- If items do not pertain to wartime measures that would indicate preparations against or for attack U

d. Names and locations of (XXX) test program participants U Protect as FOUO

28. DEGREE OF PROTECTION IN TRANSIT/STORAGE/ PACKAGING:

- a. When the information reveals an operational deficiency/limitation S OADR Note 12
- b. When the information reveals a classified plan or operation S OADR Note 12
- c. When the information does not apply to (a) or (b) U

29. T&E PROGRAM:

- a. Funding (individual contracts or projects, program, total T&E effort) U
- b. Budget year, prior year(s), future fiscal year(s) or total dollars U
- c. Quantities by budget or future fiscal year(s) U

30. PRODUCTION AND PROCUREMENT:

- a. Contract delivery schedules of (XXX) equipment and material U Protect as FOUO

b. Delivery schedules for equipment and material needed in conduct of a test/project when information reveals operational deficiency/limitation or anticipated fielding plan for urgently needed or new technology system(s) S OADR

J. SECTION IX

NOTES

1. Security classification must be determined by detailed considerations of all applicable elements. When partial information is presented, the lowest classification consistent with adequate protection will be assigned.
2. The establishment of security classification levels for the deployment data within a theater is the responsibility of the Theater Commander.
3. Any information revealing possible countermeasures and counter-countermeasures to U.S. military (XXX) equipment/systems will normally be classified SECRET. Any detailed discussion, report, or study of system capabilities and/or limitations from which conclusions may be drawn that would suggest enemy tactics most likely to defeat U.S. equipment/systems and techniques will be classified SECRET.
4. Classify in accordance with source material or information revealed.
5. Equipment shall be safeguarded in accordance with the requirements for the category of information revealed by the equipment. Commercial equipment is normally unclassified. Specifically designed equipment and/or specifically designed equipment utilizing commercial equipment will be assigned a security classification commensurate with the performance characteristics or parameters of information that is revealed.
6. Security classification of computer programs, or segments thereof, shall be based on the classification of the information or parameters that can be revealed by the program. In order to accurately classify a particular program, review applicable SCGs and apply only that level of classification required to protect the parameters contained in the program. This

note applies to interim and final products (tape, card deck, listings, etc) as well as any software documentation which can reveal the classified data.

7. Reports, publications, drawings, schematics, photographs, models, mockups, training aids, and graphs will be assigned a security classification as determined by the appropriate application of this security classification guide and information revealed.
8. Unclassified items may become sensitive or classified when compiled. See individual sections for overall highest classification.
9. Consult appropriate classification guidelines which are applicable to unique U.S. Military aircraft, ground support equipment and systems, collection systems, facilities, computer programs, and operational tactics.
10. The relationship of data to telemetry channel, calibration, raw telemetry, and frequency of operation shall be classified in accordance with the information which might be discernible from them. The telemetry encryption shall be SECRET and raw telemetry shall be unclassified. The relationship of raw telemetry to calibration is classified by the data revealed.
11. Classify end item in accordance with the highest classified item revealed.
12. Movement and storage of classified hardware between installation and activities will be accomplished in accordance with the provisions of DoD 5200.1R and DoD 5220.22M.

ANNEX M

MILESTONE REVIEWS

A. INTRODUCTION

DDT&E will normally review the progress of the JFS at three established milestones: when the program issues are solidified, upon completion of the program test concept, and after coordination of the JFS final report. This annex provides guidance for these reviews in the form of suggested outlines for the review presentations. These suggested outlines are provided as formats that should be tailored to the specific requirements of the JFS concepts and/or issues.

The first milestone review should be an IPR that will be conducted for DDT&E after the

JFS is organized and the concepts and/or issues have been solidified. The second milestone should be a TAB review of the JT&E concept. The focus of this review will be on the technical aspects of the JT&E concept in terms of credibility and risks. The final milestone should be a TAB/DDT&E review of the JFS final report and the APA. This review will be conducted after both documents have been coordinated with all interested agencies. The focus of this review will be the results of the JFS and, if a favorable chartering decision is anticipated, the technical competency and credibility of the APA. Suggested outlines for these reviews are contained in the following sections.

B. SUGGESTED OUTLINE FOR FIRST MILESTONE REVIEW (IPR)

1.0 Introduction

- 1.1 Title/Nomination Organization/Agency
- 1.2 Lead Service/Executive Agency/FSD
- 1.3 Supporting Services/Executive Agencies
- 1.4 Other Major Players
- 1.5 Purpose and Focus of Review (establishment of JFS and solidification of concepts and/or issues)

2.0 Background

- 2.1 Nomination and Problem Statement
 - 2.1.1 Limitations
 - 2.1.2 Constraints
- 2.2 Feasibility Study
 - 2.2.1 Purpose
 - 2.2.2 Test Concepts and/or Issues and Objectives
 - 2.2.3 Test Articles
- 2.3 Scope of Study
 - 2.3.1 Mission Requirements
 - 2.3.2 System Requirements

- 2.3.3 Participants
- 2.3.4 Users of JT&E Test Results
- 2.3.5 Focus of JT&E

3.0 JFS Establishment

- 3.1 Facilities
- 3.2 Staff
 - 3.2.1 Identify/Quantify
 - 3.2.2 Formal Request to Service POC
 - 3.2.3 Organization/Responsibilities
- 3.3 Communications and ADP
- 3.4 Funds
 - 3.4.1 Original Budget Estimate
 - 3.4.2 Revised Budget Estimate
- 3.5 JFS Schedule
- 3.6 Security
 - 3.6.1 Security Classification Guide
 - 3.6.2 Procedure
 - 3.6.3 SCIF Requirements
- 3.7 Coordination Chain
 - 3.7.1 Signature Authority

4.0 Concepts/Issues

- 4.1 JT&E Problem Statement (as refined by FSD)
- 4.2 Concepts/Issues Justification Statement
- 4.3 Coordination
 - 4.3.1 Organizations
 - 4.3.2 Recommended Revisions
 - 4.3.3 Rectification of Recommendations
- 4.4 Solidified Issues

5.0 Problems

6.0 Status Summary of JFS and Recommendations

C. SUGGESTED OUTLINE FOR SECOND MILESTONE REVIEW (JT&E CONCEPT)

1.0 Introduction

- 1.1 Purpose of JT&E
- 1.2 Program Overview/Direction
 - 1.2.1 Background
 - 1.2.2 Authority

- 1.3 JT&E Focus
- 1.4 Environment
- 1.5 Is the JT&E Necessary?
- 1.6 Summary

2.0 Joint Test & Evaluation Concept Description

- 2.1 Nomination Concerns and Problems
- 2.2 Goals and Objectives
- 2.3 Limitations and Constraints
- 2.4 Scope of JT&E Concept
 - 2.4.1 Mission Requirements
 - 2.4.2 System Requirements
- 2.5 Issues
- 2.6 Test Articles
- 2.7 Models and Simulations
- 2.8 Overall

3.0 JT&E Test Methodology

- 3.1 Structured Breakdown of Issues
 - 3.1.1 Effectiveness Issues
 - Measures
 - Data Elements
 - 3.1.2 Suitability Issues
 - Measures
 - Data Elements
- 3.2 Data Collection Methodology
 - 3.2.1 Data Collection
 - Data Elements
 - Controlled/Uncontrolled Variables
 - 3.2.2 Data Processing
 - 3.2.3 Data Storage and Retrieval
- 3.3 Data Analysis Methodology
 - 3.3.1 Statistical Significance
 - 3.3.2 Credibility of Analysis Results

4.0 Joint Test & Evaluation Concept Approach

- 4.1 Test Scenario
- 4.2 Approach for Resolving Issues
 - 4.2.1 Pretest/Test/Posttest
 - 4.2.2 Test Methods
 - 4.2.3 Test Cells
 - 4.2.4 Test Opportunities
 - 4.2.5 Test Activity Schedule
- 4.3 JT&E Products

5.0 Program Management

D. SUGGESTED OUTLINE FOR THIRD MILESTONE REVIEW (JFS FINAL REPORT)

Executive Summary

1.0 Introduction

2.0 Joint Feasibility Study Results

- 2.1 Literature Search
- 2.2 Study Results
 - 2.2.1 Determination of User Requirements
 - 2.2.2 Test Objectives based on User Requirements
 - 2.2.3 Relationship to Other Activities
 - 2.2.4 Determination of JT&E Need
 - 2.2.5 Determination of JT&E Feasibility
 - 2.2.6 Analysis Plan for Assessment
- 2.3 Other Accomplishments
- 2.4 JFS Products
- 2.5 Recommended Structure and Location for JTF if Chartered

3.0 Problems and Solutions

- 3.1 Urgency of Need for Test Results
- 3.2 Staffing Lead Times
- 3.3 Systemic Problems and Lessons Learned
- 3.4 Unique or new Problems and Lessons Learned

4.0 Conclusions and Recommendations

- 4.1 OSD, Joint Staff and Service Concurrence
- 4.2 Expected Products
- 4.3 Benefit of Participation
- 4.4 Conclusions
- 4.5 Recommendations

Annexes (as required to substantiate conclusions and recommendations)

E. ANALYSIS PLAN FOR ASSESSMENT (APA) (if the JFS conclusion and recommendation are to charter a JTF to conduct a JT&E, the third milestone should include a review of the APA)

Executive Summary

1.0 Introduction

- 1.1 Purpose of the JT&E
- 1.2 JT&E Overview/Direction
 - 1.2.1 Background
 - 1.2.2 Authority
- 1.3 JT&E Focus
- 1.4 Environment
- 1.5 Summary

2.0 Description of JT&E

- 2.1 Nomination Concerns and Problems
- 2.2 JT&E Objectives
- 2.3 Limitations and Constraints
- 2.4 Scope of JT&E
 - 2.4.1 Mission Requirements
 - 2.4.2 System Requirements
- 2.5 JT&E Concepts and/or Issues
- 2.6 JT&E Test Articles
- 2.7 JT&E Environments

3.0 JT&E Test Methodology (focus on any deviations from the JT&E concept)

- 3.1 Structured Breakdown of Issues
 - 3.1.1 Effectiveness Issues
 - Measures
 - Data Elements
 - 3.1.2 Suitability Issues
 - Measures
 - Data Elements
- 3.2 Data Collection Process
 - 3.2.1 Data Collection
 - Data Elements
 - Controlled/Uncontrolled Variables
 - 3.2.2 Data Processing
 - 3.2.3 Data Storage and Retrieval
- 3.3 Data Analysis Process
 - 3.3.1 Statistical Significance
 - 3.3.2 Credibility of Analysis Results

4.0 JT&E Test Approach (focus is on any deviations from the JT&E concept)

- 4.1 Scenario
- 4.2 Approaches for Resolving Issues
 - 4.2.1 Pretest/Test/Posttest
 - 4.2.2 Test Methods
 - 4.2.3 Test Cells
 - 4.2.4 Test Opportunities
 - 4.2.5 Test Activities Schedule
- 4.3 JT&E Products

5.0 Data Management

- 5.1 Data Management Systems
- 5.2 Hardware and Software Systems
- 5.3 Data Handling Process
- 5.4 Data Validation Process
- 5.5 Data Analysis and Evaluation Process
- 5.6 Analysis Reporting

6.0 Program Management

Annexes (as required to substantiate the credibility of the APA)

ANNEX N

SUGGESTED OUTLINES FOR THE JFS FINAL REPORT, MANAGEMENT REPORT, AND ANALYSIS PLAN FOR ASSESSMENT

A. INTRODUCTION

The suggested outlines should be tailored to meet the specific requirements of each joint feasibility study.

B. SUGGESTED OUTLINE FOR THE JOINT FEASIBILITY STUDY FINAL REPORT

Executive Summary

1.0 Introduction/Background

- 1.1 Nomination and Problem Statement
 - 1.1.1 Assumptions
 - 1.1.2 Limitations and Constraints
- 1.2 Feasibility Study Purpose
 - 1.2.1 Test & Evaluation Concepts or Issues and Objectives
 - 1.2.2 Test Articles
- 1.3 Scope of Study
 - 1.3.1 Mission Requirements
 - 1.3.2 System Requirements
 - 1.3.3 Participants and Users of Test & Evaluation Results
 - 1.3.4 Test & Evaluation Focus

2.0 Task Needs

- 2.1 Test Requirements
- 2.2 Scenarios
- 2.3 Decomposition of Concepts or Issues
 - 2.3.1 MLMs
 - 2.3.2 MOEs
 - 2.3.3 MOPs
- 2.4 The Aggregation of Measures
- 2.5 Data Requirements
 - 2.5.1 Baseline
 - 2.5.2 Types of Data Required
- 2.6 Test Resource Requirements
 - 2.6.1 Proposed Exercise Participation/Test Sites
 - 2.6.2 Schedule

- 2.6.3 Funding
- 2.6.4 Project Management
- 2.6.5 Personnel Support
- 2.6.6 Equipment and Instrumentation

3.0 Joint Feasibility Study Methodology

- 3.1 Ground Rules
 - 3.1.1 Directions
 - 3.1.2 Assumptions
- 3.2 Alternative Test Methods
 - 3.2.1 Minimum Size Test Program
 - 3.2.2 Optimum Size Test Program
- 3.3 Summary of Test Concept
 - 3.3.1 Data Collection
 - 3.3.2 Analysis Plan

4.0 Joint Feasibility Study Results

- 4.1 Literature Search
- 4.2 Study Results
 - 4.2.1 Determination of User Requirements
 - 4.2.2 Test & Evaluation Objectives Based on User Requirements
 - 4.2.3 Relationship to Other Activities
 - 4.2.4 Determination of JT&E Need
 - 4.2.5 Analysis Plan for Assessment
 - 4.2.6 Determination of JT&E Feasibility
- 4.3 Other Accomplishments
- 4.4 JFS Products

5.0 Problems and Solutions

- 5.1 Staffing Lead Time
- 5.2 Others

6.0 Conclusions and Recommendations

- 6.1 OSD, Joint Staff and Service Coordination /Concurrence
- 6.2 Expected Products
- 6.3 Benefits of Participation
- 6.4 Conclusions
- 6.5 Recommendations
- 6.6 Recommendations Relative to JTF (if charter is recommended)
 - 6.6.1 Location
 - 6.6.2 Staffing

- 6.6.3 Estimate of Funding Requirements by Fiscal Year and Categorized by Each Service and OSD
- 6.6.4 Estimate of Resources Requirements by Fiscal Year and Categorized by Each Service and OSD

Annexes (as required to substantiate conclusions and recommendations)

**C. SUGGESTED OUTLINE FOR THE JOINT FEASIBILITY STUDY
MANAGEMENT REPORT (not required if recommending that JT&E be
chartered)**

Executive Summary

1.0 Introduction

- 1.1 Purpose of Report

2.0 Assessment of Accomplishments

- 2.1 Relative to First Chartered Objective
- 2.2 Relative to Second Chartered Objective
- 2.3 Relative to Third Chartered Objective
- 2.n Relative to *n* Chartered Objective

3.0 Lessons Learned

- 3.1 Same or Similar to Lessons Learned That Were documented by Previous JFSs or JTFs
 - 3.1.1 Lesson #1
 - 3.1.2 Lesson #2
 - 3.1.3 Lesson #3
 - 3.1.n Lesson #n
- 3.2 Lessons Learned That Were Unique to this Joint Feasibility Study
 - 3.2.1 Lesson #1
 - 3.2.2 Lesson #2
 - 3.2.3 Lesson #3
 - 3.2.n Lesson #n

4.0 Recommendations

- 4.1 Recommendations (1-*n*)

D. SUGGESTED OUTLINE FOR THE ANALYSIS PLAN FOR ASSESSMENT

Executive Summary

1.0 Introduction

- 1.1 Purpose/Authority

- 1.2 Background/Problem
- 1.3 Joint Feasibility Study Results
 - 1.3.1 Is a JT&E Needed?
 - 1.3.2 Is a JT&E Feasible?
- 2.0 JT&E Description**
- 2.1 Concepts, Issues, and Objectives
 - 2.1.1 Coordination
 - 2.1.2 Approval
- 2.2 Scope of JT&E
 - 2.2.1 Test Articles/Methodologies/Participants
 - 2.2.2 Assumptions
 - 2.2.3 Constraints and Limitations
- 2.3 Test Scenario
- 2.4 Test Measures
 - 2.4.1 Mission level measures
 - 2.4.1.1 Data elements
 - 2.4.2 Effectiveness Measures
 - 2.4.2.1 Data Elements
 - 2.4.3 Suitability Measures
 - 2.4.3.1 Data Elements
- 2.5 Test Concept
 - 2.5.1 Approach for Concepts/Issue Resolution
 - 2.5.2 Test Methods
 - 2.5.2.1 Cost/Credibility of Results
 - 2.5.2.2 Availability/Technical Maturity
 - 2.5.3 Test Cells
 - 2.5.3.1 Controlled Variables
 - 2.5.3.2 Uncontrolled Variables
 - 2.5.3.3 Sample Sizes/Confidence Levels/Technical Significance
 - 2.5.4 Test Activities
 - 2.5.4.1 Test Activity 1
 - 2.5.4.1.1 Relationship of test activity to program
 - 2.5.4.1.2 Location
 - 2.5.4.1.3 Instrumentation Requirements
 - 2.5.4.1.4 Resource Requirements
 - 2.5.4.1.5 Environmental Considerations
 - 2.5.4.2 Test Activity 2
 - 2.5.4.2.1 Relationship of test activity to program
 - 2.5.4.2.2 Location
 - 2.5.4.2.3 Instrumentation Requirements
 - 2.5.4.2.4 Resource Requirements
 - 2.5.4.2.5 Environmental Considerations

- 2.5.4.3 Test Activity *n*
- 2.6 Schedule
 - 2.6.1 Test Opportunities/Events
 - 2.6.2 JT&E Schedule
- 2.7 Resources (size may dictate that content be included as an annex)
 - 2.7.1 Consolidate Resource Estimate
 - 2.7.2 Fiscal Requirements
 - 2.7.3 Alternatives
 - 2.7.3.1 Programmatic Restructuring
 - 2.7.3.2 Technical Restructuring

3.0 Program Analysis

- 3.1 Analysis Methodology
 - 3.1.1 Measure Type (percentages)
 - 3.1.2 Measure Type (expert opinion)
 - 3.1.2.1 Expert Selection
 - 3.1.2.2 Structure Interview
 - 3.1.2.2.1 Expert Preparation
 - 3.1.2.2.2 Questionnaire
 - 3.1.2.3 Results Analysis
 - 3.1.3 Measure Type (user assessments)
- 3.2 Description of Measures (measure attributes)
 - 3.2.1 Completeness
 - 3.2.2 Quality
 - 3.2.2.1 Uncertainty
 - 3.2.2.2 Consistency
 - 3.2.3 Efficiency
- 3.3 Event Reconstruction

4.0 JT&E Products

- 4.1 Description
 - 4.1.1 Documents
 - 4.1.2 Simulations, Models
 - 4.1.3 Others
- 4.2 Users of products
- 4.3 Disposition of products

5.0 JT&E Management

- 5.1 Organization
- 5.2 Reports

Annexes (as required to provide rational used in the selection of methodologies, techniques, test methods, test activities, etc.)

ANNEX O

TECHNICAL ADVICE

A. INTRODUCTION

The JT&E Program receives advice from a number of technical organizations that are available to council JT&E Program directors and administrators, Joint Feasibility Study Directors, and Joint Test Directors on technical, test, and doctrinal issues related to the program in general and specific JT&Es in particular. These technical organizations include the JT&E Senior Advisory Council (SAC), the JT&E Technical Advisory Board (TAB), Technical Advisory Groups (TAG), General Officer Steering Committees (GOSC), and Functional Expert Panels. The following sections contain information and recommendations relative to when an advisory organization could be beneficial, who is responsible for establishing/providing advisory organizations, and how these advisory organizations can be used to reduce the risk associated with JT&E activities and events.

B. JT&E SENIOR ADVISORY COUNCIL (SAC)

The JT&E SAC is a senior-level advisory group that reviews candidates for entry into the JT&E Program, Joint Feasibility Study and Joint Test and Evaluation progress and results, and recommends appropriate actions to the D,T,SE&E. The Service members on the SAC also commit the personnel and resources required for the conduct of the JFS and JT&E activities. The SAC meets in June of each year or at the call of the Chairperson. The following organizations provide personnel who are permanent members of the SAC. A list of current SAC members is included in the JT&E Program handout entitled "Documents Related to JT&E Programs."

The JT&E SAC is composed of the following members:

Co chairperson	D,T,SE&E and DOT&E OSD(PA&E) OSD(S&SS) Joint Staff (J-8) ODCSOPS-FDZ CNO(N-091) OSD/C3I OSD/SOLIC USAF/TE USMC Systems Command - Chief of Staff BMDO, TMD
Executive Advisor:	Chairperson of JT&E Planning Committee
Technical Advisor:	Chairperson of TAB (non voting member)

The responsibilities of the JT&E SAC are as follows:

1. Recommend and prioritize candidates for entry into the JT&E Program.
2. Review JFS results in terms of:
 - a. Need of proposed JT&Es.
 - b. Proposed JT&E concepts and Program Test Designs.
 - c. Feasibility of proposed JT&Es.
 - d. Impact and availability of resource requirements.
 - e. Availability of OSD and Service funds to support the proposed JT&Es.
 - f. Recommendations for lead and participating Services.
 - g. Anticipated improvements in joint capabilities.

- h. Opportunities for proposed JT&Es to be incorporated into scheduled joint activities.
- 3. Establish schedules for JFSs and JT&Es.
- 4. Commit Service support and resources to JFSs and JT&Es.
- 5. Review and recommend JT&E Program management and policy changes.
- 6. Review JT&E final reports.

C. JT&E TECHNICAL ADVISORY BOARD (TAB)

The JT&E TAB is an organization of senior civilian scientists and engineers from OSD and the Services who advise the SAC, nomination sponsors, FSDs, and JTDs on the technical issues related to the JT&E Program in general and JFSs and JT&Es in particular. The nomination and selection of TAB members is based on current expertise and experience relative to the planning, conduct, and evaluation of large scale tests, exercises, and simulations. The TAB provides advice on JT&E nominations, monitors JT&E activities, and provides technical advice and guidance to FSDs and JTDs in order to minimize the risk and cost associated with JT&Es. The OSD and Services nominate qualified individuals for the TAB. The D,T,SE&E reviews the nominations for JT&E TAB membership and approves those considered to be most qualified. The TAB meets in May of each year or as directed by the Chairperson. A list of current JT&E TAB members is included in the JT&E Program handout entitled "Documents Related to JT&E Programs."

The JT&E TAB is composed of the following persons:

Chairperson: Rotated periodically among permanent members

Permanent members: One member from each of the Services

Non permanent members: Civilian scientists having specific technical expertise related to a particular JT&E and supported/participating CINC representatives, as appropriate

The responsibilities of the JT&E TAB are as follows:

- 1. Review and determine the technical adequacy of APAs and PTPs.
- 2. Review and determine the technical adequacy of individual test plans, data management and evaluation plans, and test reports.
- 3. Provide technical recommendations to the JT&E SAC concerning JT&E Program candidates, JFSs, and JT&Es.
- 4. Assist in defining common elements among JT&Es, maximizing the possibility of resource sharing, minimizing the cost associated with JT&Es, and preserving significant residual assets developed in conjunction with JT&Es for future use. These residual assets are primarily scenarios, databases, computer simulations, algorithms, test facilities, instrumentation, and threat simulators.
- 5. When required, recommend personnel to staff TAGs for a JFS or JT&E.
- 6. Provide technical advice to the JT&E SAC, JFSs, and JTDs.
- 7. Provide recommendations to the DDT&E relative to the continuation or termination of JFSs and JT&Es.

D. TECHNICAL ADVISORY GROUP (TAG)

A TAG is a technical body formed to provide direct technical support to a JFS. The FSD, with coordination and approval of DDT&E, will determine if and when a TAG is required. TAG members may be nominated by the TAB, suggested by the Service Operational Test Agencies (OTAs), requested by the FSD, or suggested from other sources. The FSD will coordinate directly with the Service OTAs to obtain the services of TAG members. The composition of a TAG may vary as the technical nature of the JFS changes. The TAG will meet at the call of the FSD and is not a permanent full-time part of the JFS staff. The TAG may provide assistance either collectively or through the actions of individual members.

A TAG is composed of the following members:

If established, the TAG composition will be determined by the FSD and will normally be made up of individuals from the Services (usually senior civilians) who have technical proficiency particularly suited to the JFS.

The responsibilities of a TAG are as follows:

1. Review and provide technical comments and recommendations on plans, analysis results, and test reports.
2. Assess appropriateness and output of simulations suggested or developed for a proposed JT&E or specific test events.
3. Identify sources of technical assistance and provide technical liaison with these sources.

4. Provide the JT&E TAB with technical advice and assistance as required.
5. Provide the FSD with technical advice and assistance as required.

E. GENERAL OFFICER STEERING COMMITTEE (GOSC)

A GOSC should be established to review and provide advice on JFS issues pertaining to policy, doctrine, tactics, and resources. A GOSC is a group of general officers from the Services and participating theater CINCs who are invited by the FSD to advise on doctrine, policy, or tactics issues. The intent of a GOSC is to capture and integrate Service representation at a senior officer level. The FSD will determine if and when a GOSC is required. GOSC members may be nominated by the TAB, suggested by the Service OTAs, requested by the FSD, or suggested from other sources. The FSD will coordinate directly with the Service OTAs to obtain the services of GOSC members. The GOSC will meet at the call of the FSD and is not a permanent full-time part of the JFS staff. The GOSC provides guidance either collectively or through the actions of individual members and should be included in the review cycle of JFS produced concepts, products, and documents.

A GOSC is composed of the following members:

If established, the GOSC composition will be determined by the FSD and will normally be made up of flag officers (1-2 star level) from the Services involved in the JFS, those who will provide test resources, or those who could be affected by the JFS results and recommendations.

The responsibilities of a GOSC are as follows:

1. Provide the FSD with a forum for senior level advice and guidance with respect to Service policy, doctrine, and tactics.
2. Review APA, study results/conclusions, and reports.
3. Provide advice relative to the availability or resources and Service events to support planned activities.
4. Provide advice relative to coordination requirements and the identification of signature authorities.
5. Provide assistance in arranging meeting and briefing schedules.
6. Provide assistance in obtaining the use of Service assets and resources to include information or access to classified programs.

F. FUNCTIONAL EXPERT PANELS

If the JFS involves issues, techniques, or equipment that are technically complex, the FSD should consider establishing Functional Expert Panels to obtain expertise or assistance that is not available within the JFS. Functional Expert Panels will involve the technical communities associated with the JFS activities, and this involvement will be helpful in the coordination and acceptance of JFS results. Functional Expert Panel members may be suggested by the TAB, the Service OTAs, other sources, or identified by the FSD. The FSD will coordinate with the Service OTAs to obtain the services of Functional Expert Panel members from Service resources. The FSD will coordinate with the OSD JT&E Coordinator to obtain the services of non-DoD Functional Expert Panel members.

A Functional Expert Panel is composed of the following members:

If established, the Functional Expert Panel composition will be determined by the FSD and will be made up of members who are experts in the required specific test areas. Functional Expert panel members can be Service members, Government Service employees, contractors, or in some instances, civilians.

The responsibilities of a Functional Expert Panel are as follows:

1. Provide direct technical expertise and assistance to the JFS.
2. Leverage JFS expertise by involving the technical communities.
3. Assist in identifying and obtaining additional expertise when required.
4. Expand awareness of JFS efforts to the technical communities.
5. Assist in coordination and acceptance of JFS results and reports.
6. Assist in avoidance of the "not invented here" syndrome.

G. JT&E PLANNING COMMITTEE (JT&E PC)

The JT&E PC is a working group that assists in developing and evaluating JT&E nominations and preparing them for senior level review. The JT&E PC Chairperson is the OSD JT&E Coordinator. The JT&E PCs permanent membership is drawn from OSD, the Joint Staff, and the Services. The JT&E PC members interface with and represent their respective Services and agencies. The Services and agencies may send additional personnel to the JT&E PC meetings to provide additional information or assistance as may be required. The JT&E PC meets at the call of the Chairperson and serves as the action staff for the JT&E TAB and SAC.

The JT&E PC is composed of the following members:

Chairperson: OSD JT&E Coordinator

Permanent members: One member from DOT&E

One member from the Joint Staff

One member from each of the Services

One member from OSD/PA&E

Non permanent members: One representative from each agency submitting a nomination for consideration

The responsibilities of the JT&E PC are as follows:

1. Receive and prioritize JT&E Program nominations.
2. Review JT&E nominations to:
 - a. Determine jointness, feasibility, and validity of potential results.
 - b. Identify duplications and possible consolidations.
 - c. Determine adequacy of data, resource estimates, and test objectives.
3. Recommend nominations by priority to the TAB for consideration.
4. Functions as the action staff for the JT&E TAB and SAC.